SKEPTICAL INQUIRER

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'HONESTY' TESTS
How Valid Are They?

Mathematical Magic • Challenging Education Myths
Astrology's Counterattack • Science & Feminism • Weird Water

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of Claims of the Paranormal

THE SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal, an international organization.

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Vol. 18, No. 1, Fall 1993

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SPECIAL REPORT

'Perspectives on Education in America': Sandia Study Challenges Misconceptions *Kendrick Frazier* **26**

ARTICLES

Do 'Honesty' Tests Really Measure Honesty? *Scott O. Lilienfeld* **32**

Astrology Strikes Back—But to What Effect? *Geoffrey Dean* **42**

Diagnoses of Alien Kidnappings That Result from Conjunction Effects in Memory *Robyn M. Dawes and Matthew Mulford* **50**

Mathematical Magic for Skeptics *Arthur Benjamin and Michael Shermer* **52**

The Blind Girl Who Saw the Flash of the First Nuclear Weapon Test *Rolf Sinclair* **63**

Science: The Feminists' Scapegoat? *Barbara G. Walker* **68**

NEWS AND COMMENT **3**

UFO 'Dogfight' in Kentucky / CSICOP Wins Lawsuit in Maryland / Old Minerals with New Names in Vermont / Paranormal Hotline in Nebraska / The 'Face' in the Cervix / Notes and Comments

NOTES OF A FRINGE-WATCHER

Weird Water, or $H_2Oh!$ *Martin Gardner* **15**

PSYCHIC VIBRATIONS

Alien Stigmata, Shy Craft, and a UFO Conference *Robert Sheaffer* **21**

BOOK REVIEWS

Paul Eberle and Shirley Eberle, *The Abuse of Innocence: The McMartin Preschool Trial* *Lloyd K. Stires* **73**

Lyall Watson, *The Nature of Things: The Secret Life of Inanimate Objects* *Robert A. Baker* **76**

Anthony Aveni, *Conversing with the Planets* *L. Stephen Coles* **79**

Jacques Vallee, *UFO Chronicles of the Soviet Union* *Erik Vaughn* **82**

NEW BOOKS **89**

ARTICLES OF NOTE **90**

FORUM

Science and Truth and Us *Ralph Estling* **95**

American Indians and the New Age *Rick Romancito* **97**

LETTERS TO THE EDITOR **100**

ON THE COVER: Illustration by Bruce Adams.

HELP US DEFEND SKEPTICISM AGAINST HARASSING SUITS

CSICOP LEGAL DEFENSE FOUNDATION

In the Winter 1992 issue of the SKEPTICAL INQUIRER we outlined the difficulties that the Committee for the Scientific Investigation of Claims of the Paranormal is experiencing because of harassing lawsuits filed against skeptics.

We feel confident that these suits will eventually be dismissed. Still, we suspect that the lawsuits were brought for reasons other than the redress of alleged grievances.

For what do these suits mean? They mean that the pro-paranormalists think they have finally found a way to strike below the belt of scientists and skeptics. For years they have been unable to prove their claims of miraculous abilities. They've grown tired of hearing our challenges. Now they have turned to intimidation by lawsuit in an effort to silence their only persistent critics.

It doesn't necessarily matter if the plaintiff wins or loses the suit. Their purpose is to waste their opponents' resources and to intimidate and silence them—in effect, depriving individuals or organizations of their First Amendment rights.

We are by no means a wealthy organization, but we are not prepared to surrender our rights. *We have vowed to fight back.* To do so, we need your support. CSICOP has established the CSICOP Legal Defense Foundation. Its funds will be used to help pay the costs of existing lawsuits and any that may arise in the future, and to countersue when appropriate.

Don't allow the claim-mongers to destroy CSICOP (and the values of science and reason it steadfastly represents) through unjust and frivolous legal proceedings. Support the CSICOP Legal Defense Foundation today. It's the best way to blunt this frightening new weapon of the apostles of nonsense.

Yes, I want to help defend the rights of skeptics. Enclosed is my tax-deductible contribution of $ _____

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News and Comment

UFO 'Dogfight': A Ballooning Tale

"UFO Fires on Louisville, Ky. Police Chopper" was the headline on the *Weekly World News*'s May 4 cover story, complete with fanciful illustration. But if the tabloid account seemed overly sensational in describing the "harrowing two-minute dogfight"—before vanishing into the night—it was only following the lead of the respected *Louisville Courier-Journal*. The *Courier* had used similar wording in relating the February 26 incident (which had not been immediately made public), headlining its front-page story of March 4: "UFO Puts on Show: Jefferson [County] Police Officers Describe Close Encounter."

Unfortunately, the *Weekly World News* did not cite the *Courier*'s follow-up report that explained the phenomenon. Yet the tabloid's tale contained numerous clues that might have tipped off an astute reader. The first sighting was of what looked like "a fire" off to the patrol craft's left; the "pear-shaped" UFO was seen in the police spotlight "drifting back and forth like a balloon on a string"; after circling the helicopter several times, the object darted away before zooming back to shoot the "fireballs" (which fortunately "fizzled out before they hit"); and then—as the helicopter pilot pushed his speed to over 100 mph—the UFO "shot past the chopper, instantly climbing hundreds of feet," only to momentarily descend again before flying into the distance and disappearing. That the "flowing" object was only "about the size of a basketball" and that it had "hovered" before initially approaching the helicopter were

Scott Heacock (*left*) puts the finishing touches on a model hot-air balloon like the one he had launched in Louisville, Kentucky, on February 26. Looking on is psychologist Robert A. Baker. (Photo by Joe Nickell.)

additional clues from the original *Courier* account that the tabloid omitted.

The *Courier*'s follow-up story of March 6 was headed "A Trial Balloon?" It pictured Scott Heacock and his wife, Conchys, demonstrating how they had launched a hot-air balloon Scott had made from a plastic dry-cleaning bag, strips of balsa wood, and a dozen birthday candles—a device familiar to anyone who has read Philip J. Klass's *UFOs Explained* (Vintage Books, 1976, pp. 28-34, plates 2a and 2b). No sooner had the balloon cleared the trees, said Heacock, than the county police helicopter encountered it and began circling, shining its spotlight on the glowing toy.

The encounter was a comedy of errors and misperceptions. Likened to a cat chasing its tail, the helicopter was actually pushing the lightweight device around with its prop wash. In fact, as indicated by the officers' own account, the UFO zoomed away in response to the helicopter's sudden propulsion—behavior consistent with a lightweight object. As to the "fireballs," they may have been melting, flaming globs of plastic, or candles that became dislodged and fell, or some other effect. (Heacock says he used the novelty "relighting" type of birthday candles as a safeguard against the wind snuffing them out. Such candles may sputter, then abruptly reflame.)

Although one of the officers insisted the object he saw that night traveled at speeds too fast for a balloon, he seems not to have considered the effects of the helicopter's prop-wash propulsion. Contacted by psychologist and skeptical investigator Robert A. Baker, the other officer declined to comment further, except to state his feeling that the whole affair had been "blown out of proportion" by the media. Be that as it may, a television reporter asked Scott Heacock how certain he was that his balloon was the reported UFO. Since he had witnessed the encounter and kept the balloon in sight until it was caught in the police spotlight, he replied: "I'd bet my life on it." To another reporter, his Mexican wife explained: "I'm the only alien around here."

—*Joe Nickell*

Joe Nickell, CSICOP Fellow and investigative writer, teaches at the University of Kentucky.

CSICOP Wins Lawsuit In Maryland

On June 4, 1993, a federal jury in Baltimore, Maryland, found the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) not liable for statements made by magician James "The Amazing" Randi regarding the personal life of the plaintiff in the case, Eldon Byrd. The verdict was handed down in the court of U.S. District Judge Marvin Garbis.

In 1989, Byrd sued Randi and CSICOP for more than $30 million, alleging libel, slander, and invasion of privacy for statements made by Randi in a 1988 interview with the now-defunct *Twilight Zone* magazine and at a 1988 speech for the New York Area Skeptics.

Although the jury did find that some of the statements made by Randi regarding Byrd were defamatory, it refused to award Byrd any damages whatsoever.

CSICOP was named in the lawsuit because the plaintiff contended that Randi was acting as an agent of CSICOP and was authorized, or apparently authorized, to speak on

CSICOP's behalf.

During the two-week trial, both Randi and CSICOP testified that Randi was not authorized to speak for CSICOP and that Randi had not requested permission to do so. It is a long-standing policy of the CSICOP Executive Council that members of the Council are not authorized to speak for CSICOP on any topic unless permission has been granted by a majority of the other members of the Council.

Accordingly, CSICOP contended at the trial that Randi was neither authorized nor apparently authorized by CSICOP to make the statements at issue in the suit. The jury agreed.

—*Barry Karr*
CSICOP Executive Director

What on Earth? From Old Minerals To New Mystical Gems

A mail-order establishment in Marshfield, Vermont, called Heaven & Earth, publishes a catalog not only selling "metaphysical" jewelry but also trading on some highly creative mineralogical nomenclature. Heaven & Earth invents new names for old minerals and claims that they are new discoveries. Each one is presented in the catalog with lavish "channeled information" concerning its properties. This information is usually attributed to an outside consultant channeler.

The proprietors include a small disclaimer to the effect that they don't advocate the use of stones as a substitute for conventional medical or psychological care. That said, they go on to provide 16 large, closely printed pages of medical and/or psychological advocacy for their stones, all of which are notably expensive.

The mineral spurrite, well known since 1908, has been rediscovered and renamed "strombolite" by this establishment, which informs us that strombolite's whitish veins are "lightning strikes" that direct energy toward fortification of one's weaknesses and create instantly noticeable healing. Strombolite also enhances memory and the integration of knowledge. Combined with another mineral, newly named "merlinite," it will "bring access to the Cosmic Book of Knowledge," which is also parenthetically and most mysteriously described as "The Void."

Void indeed. It turns out that merlinite is nothing but drusy crystalline (misspelled "druzy crystaline") quartz, blackened by inclusions of the manganese oxide known as psilomelane. The latter is given a highly original spelling, "solalamine." Merlinite is said to bring on an instant alpha state, etheric body "allignment" (*sic*)—

with what, we are not told—time traveling, and grounding light into one's negative energies. Heavy work for a piece of blackened quartz.

The newsletter/catalog that first announced the wonders of merlinite gave no indication of its composition. This writer asked Heaven & Earth for the real name of the mineral and was told that merlinite is the true species name of a brand-new discovery and that the original discovery date and chemical formula are closely guarded secrets. The informant (or uninformant) was adamantly opposed to making any such details available to the public.

Of course there is no such secrecy attending any discovery of a genuinely new mineral. The very process of establishing its species status depends on extensive testing and publication of test results in accredited journals.

A similar inquiry about another Heaven & Earth find named *azeztulite* met with similar evasion. Heaven & Earth claimed that their azeztulite came from a beryllium mine and might be a beryllium silicate like phenakite (which they always spell "phenacite"), but that it is not phenakite. Its formula is not known because "the miners" haven't finished testing it yet. (Miners don't do tests for new mineral species.) The Heaven & Earth catalog describes azeztulite as a mineral specially selected by a space-traveling "group soul," the Azez, "to re-engineer the etheric pattern of its energies so that it can become a conductor or conduit for the energy of the Nameless Light." The material shown in the catalog's color illustration of azeztulite jewelry looks very much like chips of plain glass, which would indicate a distinct lack of discrimination on the part of the Azez. But whatever it is, Heaven & Earth refuses to say. Evidently azeztulite is another secret to be revealed only to channelers and never, never to mineralogists.

Another alleged discovery has received the Heaven & Earth name of Gel Litium Silica or Gel Lithium Silicate, depending on which page of the catalog one reads, though it is declared that this name was invented by those ubiquitous and mysterious miners. When pressed a bit, Heaven & Earth confessed that Gel Lit(h)ium Silica(te) is lepidolite—a violet-colored mica well known since the late 1700s—combined with quartz. It is said to balance "physical systems" and to act as a diuretic for women suffering from excessive water retention.

Another stone, imaginatively renamed Aphrodite, is called a welcome surprise "only now entering the awareness of metaphysical stone-users." The real name of this stone is mentioned just once. It is cobaltian calcite, in the form of microscopic pink crystals clustered on a rock matrix. The catalog claims that Aphrodite will "strongly aid the tissues of the body" and improve circulation, besides bringing about success in love.

Though Heaven & Earth's proprietors continually suggest an extensive empirical knowledge of minerals on their part, they do consistently misspell common mineral names and mineralogical terms, such as cabochon, heliodor, nickel, rhodochrosite, iridescent, translucent, crystallize, cobaltian, and many other words. Despite the upscale nature of their expensive products, they create a general impression of ignorance fostering and feeding on ignorance. It may be unfair to single them out, since the country is full of similar establishments selling minerals and jewelry on similar pretenses; but Heaven & Earth is a little different in its habit of creating "new" minerals from old ones by the simple expedient of renaming them. Thus the commonplace is made to seem rare, the tired old pseudo-

effects are made to seem new, and the customers are made to think they have bought something unusual.

Such misleading advertisers flourish in our modern atmosphere of lenient omnicredulity and scientific illiteracy. No laws exist to control them. Only an ingrained habit of skepticism, combined with willingness to do a bit of research, can identify their claims as questionable. Here is another confirmation of the necessity for skepticism, which may be one of the most needed if least appreciated of all modes of thought.

—*Barbara G. Walker*

Barbara G. Walker is the author of The Book of Sacred Stones: Fact and Fallacy in the Crystal World.

The Nebraska Experiment: A Paranormal Claims Phone Service

"Nebraskans who think they have seen ghosts, unidentified flying objects or other weird things now have a telephone help line they can call for assistance and information," began an Associated Press story released nationwide during the 1991 Easter weekend.

More than 75 calls were generated from around the nation within the subsequent five days, including some 15 inquiries from the media. CNN Headline News carried the story on Easter Sunday, and the following day an East Coast radio station called to ask, "Is this an April Fool's joke?"

Such was the reaction to the AP release, which was based on a reporter's article about what is now called the Nebraska Paranormal Referrals Service and an editor's "piggy-back" insert on a then-forthcoming Fortean conference, both published on page 5 of the March 30, 1991, issue of the *Lincoln Journal-Star.*

While the original article with its insert and the subsequent AP release contained much that is accurate, their interpretation of the intent and the concept of the telephone service created some misconceptions that need correction.

The telephone service is now housed at the Department of Psychology on the University of Nebraska-Lincoln (UNL) campus. It is available for use by citizens of Nebraska who wish to report what they believe may be a paranormal experience—which may or may not be able to be explained by existing scientific laws—or who want to discuss any paranormal claim with a behavioral or physical scientist. The 24-hour number is 402-472-9493, and all inquiries are kept confidential.

In 1987, I established the telephone service through a $10,000 endowment with the University of Nebraska Foundation as a public service in education and consumer health.

There are three sub-purposes: (1) to provide scientists with a way to collect information associated with the subjects reported, (2) to offer the inquirer more access to reliable, factual information for judging the validity of these reports or claims, and (3) to offer an atmosphere to the inquirer that promotes a scientific attitude, respect, and confidentiality.

All inquirers are reminded that reputable scientists and other professionals have not been able to demonstrate claims of the paranormal under

experimental control to the satisfaction of the scientific community in general; nor are they able to formulate quantitative theories that will explain phenomena people have described. Inquirers are also informed that humankind's innate curiosity about the unknown will very likely continue and that someone may someday discover a way to measure phenomena not now recognized or understood by modern science.

Upon dialing the 24-hour number, the caller reaches a recording machine with which to make an inquiry, describe a report, and leave a phone number or address. During daytime hours, Donald D. Jensen, a professor of psychology at UNL, provides a response, determines if a referral to a scientist affiliated with the University of Nebraska or other appropriate institution is warranted, and mails a pro/con bibliography of the paranormal to the inquirer. The inquirer is also informed about the existence of the Nebraska Paranormal Collection housed in Love Library on the UNL campus. Report forms are kept in a confidential file, but names of callers and their communities are not recorded.

Implementation of the telephone service originally occurred in March 1988 with the assignment of a mental-health educator in the Department of Psychiatry at the University of Nebraska Medical Center in Omaha to handle calls and set up the project within the Research Section when her or his duties permit. The entire operation is under the direction of the Chair at the Department of Psychology, University of Nebraska-Lincoln, 209 Burnett Hall, Lincoln, NE 68588-0308.

Several behavioral and physical scientists affiliated with the University of Nebraska system and other institutions volunteered to take referrals in their areas of expertise, such as astronomy, physics, physiology, and psychology, and in their areas of interest, such as ESP, ghosts, monsters, UFO reports, and witchcraft. The majority of these scientists were an integral part of Paranormal Claims Research, a private group of professors and lay people I co-organized in 1980 and dissolved in 1988. Additionally, anyone in the university system and elsewhere, including CSICOP, with any relevant expertise may be consulted. However, names of scientists who take referrals are not released.

In the fall of 1988, Paranormal Claims Research's revised *Selected Pro/Con Bibliography of the Paranormal*, including the phone service's telephone number and information about the Nebraska Paranormal Collection, was mailed to some 900 law-enforcement officials, private and public high school principals, college and public libraries, and other agency personnel in Nebraska. By December of that year, an official announcement on the service's stationery was mailed to the same 900 people.

As a private citizen, I also assisted in publicizing the existence of the service and the Nebraska Paranormal Collection in 1989 by having announcements placed in the Nebraska State Education Association newsletter of January 19, the State Patrol *Bulletin* #9 on March 1, the *Nebraska Library Association Quarterly*, Summer issue, and the *Nebraska Psychologist*, November issue. There was no coverage in the public media.

Despite the limited publicity, there were 54 calls from April 1, 1988, to September 30, 1990, a period of two and half years. A breakdown of the 54 different inquiries reveals that 19 could not be returned (because of "giggles" or the lack of a phone number or address); 22 involved the

Donald D. Jensen (*left*), a professor in the UNL Department of Psychology, where the telephone service is now housed, with E. A. Kral, who originally established the service in Omaha in 1987.

paranormal in general; 11 ghost/poltergeist/demonic spirits; and 2 UFO reports. (Several individuals called more than once, amounting to 10 more calls, but all calls from one individual were tabulated as one inquiry.)

It is important to note there were 6 demonic-cult reports, which may be over-representative because of media attention and rumored "satanic cult" involvement with at least three cases in the Omaha area during the 1989-90 school year. Of the 35 legitimate inquiries, 9 were referred to scientists for future discussion.

Requests for information came from 7 law-enforcement, mental-health, and library personnel, 11 students working on term papers, 7 adult individuals at large, and 1 media person.

From October 1, 1990, to September 30, 1991, there were 138 calls. (An additional 14 calls were misdirected.) A breakdown of the 138 different inquiries reveals that 17 could not be returned because of "giggles," obscenity, or the lack of phone number or address. Fifty-three involved the paranormal in general, 40 were in the ghost/poltergeist/demonic spirits category, and 28 were UFO reports.

Since only 12 contacts occurred from October 1, 1990, to March 30, 1991, the overwhelming majority were related to the March 30 article in the *Lincoln Journal-Star* and the AP story on March 31. Inquiries were received from all areas of the nation, many from the East and West coasts. Callers were referred to national organizations and publications in their local libraries and local outlets of nationwide bookstores. A few were referred to ABC-TV, since the "20/20" feature on exorcism was shown at about the same time the AP released its story.

Of the 138 legitimate inquiries, 14 were referred to scientists for further discussion. Requests for information came from 6 students working on term papers, 8 from people "curious" about the service but with no specific phenomenon to report, and 24 from media members.

From October 1, 1991, to December 31, 1992, there were 23 inquiries, of which 13 involved

requests for sources of information, 6 were from outside of Nebraska as a result of the 1991 AP story, and 4 were misdirected or nuisance calls.

People were willing to discuss their UFO reports, even though the "events" may have occurred 10 to 30 years ago, and they indicated a willingness to contact national UFO groups. Those who reported ghost/poltergeist/demonic spirits were more secretive and often voiced fears and confusion about their situations. It was difficult to provide assistance to some callers from other parts of the nation because of a lack of knowledge of their local resources.

There was a high degree of "novelization" in the reports, i.e., they were closely related to television, motion picture, and book plots. Most of the UFO reports were similar to previous ones, including a report of "reptoids" (intelligent reptiles from other planets) that closely resembled the TV movie "V." Some who reported poltergeists and demonic spirits were looking for a "ghostbuster" service.

A separate but important adjunct to the telephone service is the Nebraska Paranormal Collection, which I established in 1980 for the benefit of laymen and scholars alike. Initially, I donated $5,000 and materials with an appraised value of $1,700 to house the collection at the University of Nebraska-Omaha Folklore Archive, where it was organized by folklorist and foreign language professor Richard S. Thill, who also placed my UFO field notes in a confidential file.

With a need for more accessibility, and my desire to create an endowment for long-range maintenance of the collection, I donated another $5,000 through the University of Nebraska Foundation in 1985, and the collection and the confidential file were moved to the McGoogan Library of Medicine on the UNMC campus. In November 1992, the collection and confidential file were moved to Love Library on the UNL campus.

The telephone service was integrated in existing facilities and programs with a minimum of university time and expense. It is not a new program or an effort to legitimize paranormal beliefs or claims, as the AP release, the headline writers, and the perception of some citizens seemed to suggest.

Its intent is clearly to help callers pursue the truth rather than to reinforce or perpetuate paranormal beliefs. And while researchers who examine the data collected over a period of years may not discover anything new to science, the citizens of Nebraska will at least be able to have confidence in calling a reliable, scientific, professional source of information to assist in their efforts to assess the validity of claims asserted and disseminated, to relieve anxiety, or to satisfy their curiosity. Moreover, people who call can have confidence that their information will be treated with respect and confidentiality.

There is also built-in protection from misuse. The endowment contract stipulates that if the project does not meet a need or does not work as intended, then the funding will be transferred to the Nebraska State Historical Society for its uses.

For those who may object to the setting in which the service has been housed, I will offer an argument for the involvement of scientists found in philosopher Durant Drake's *Invitation to Philosophy* (1933; reprinted by Greenwood Press, 1968): "The insistence upon the untrustworthiness of science is usually, if not always, subtle propaganda in favor of some theology or metaphysics which would take us farther away from the world of obdurate reality rather than give us

a clearer view. Amid the welter of such day-dreams, it is safe to cling to scientific fact. The conclusions of science are the surest knowledge we have; and *so far as science goes,* we can trust it more confidently than any other brand of truth" (emphasis in original).

All of us, from time to time, need help in separating knowledge from belief. From my perspective, scientifically verifiable knowledge does improve the quality of our lives. That's what I have concluded will be the effect of treating paranormal claims as education and consumer-health issues. That's what the phone service at the UNL Department of Psychology attempts to offer the citizens of Nebraska.

—*E. A. Kral*

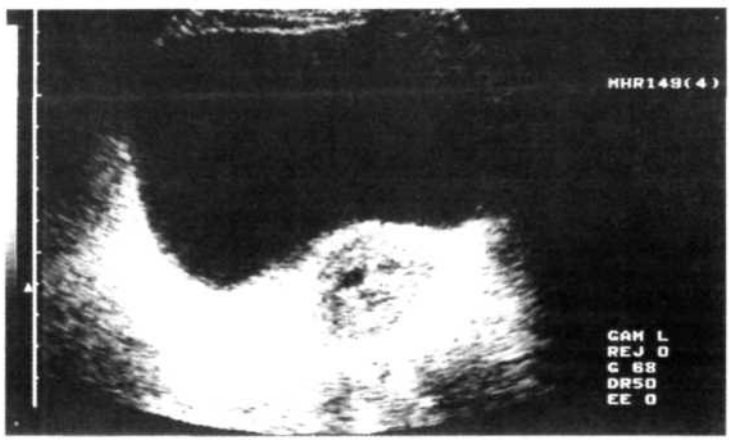
E. A. Kral is former co-chair of the CSICOP Education Subcommittee and was a high school English teacher for 30 years. He is now retired and engages in historical research and writing. Correspondence may be addressed to him at Box 356, Wilber, NE 68465.

Faces Can Be Found Just About Anywhere

The accompanying ultrasound image, submitted by Michael H. Maiman, M.D., a radiologist in Fremont, California, illustrates once again how readily images that look like human faces can be found just about anywhere.

"I am enclosing a photo taken from a recent ultrasound examination of a woman's pelvis," Maiman says in his note. "The examination shows a startling image that strongly resembles a face. The dark region in the upper part of the photo is the bladder, and the 'face' is the cervix of the uterus, in the lower central part of the photo.

"The facial features are made by small cysts (Nabothian cysts) in the cervix. As much as we scanned the area, we could not make the face disappear. . . . It just stayed there, staring at us. Being an amateur astronomer and recalling the famous face on Mars, I suspect that this 'face on the cervix' is no random distribution of cysts. Can you or CSICOP offer an explanation of this apparently paranormal phenomenon?" □



Notes and Comments

The discovery of a new species of mammal in the forests of western Vietnam is not only an exciting scientific find but a sobering lesson for all who might have thought such a thing impossible. The new genus and species of living bovid is reported by Vietnamese and Hong Kong zoologists in the June 3 *Nature* (V. V. Dung et al., 363:443-445). It has been more than 50 years since any comparable find of a large mammal species was made. The last was the kouprey *bos*, also from Indochina, in 1937. The bovid family includes cattle, sheep, goats, and antelope, but this Vu Quang bovid, given the genus name *Pseudoryx*, differs signicantly from all of them in appearance, morphology, cranial and dental features, and DNA. An adult weighs about 160 pounds and has long, smooth, almost straight slender horns and other diagnostic features. The scientists have examined more than 20 specimens, all local hunters' trophies, and they now plan a three-month field study to observe the living animal.

The syringes-in-Pepsi-cans flap this past June took less than one week to go from scary-sounding cases of multiple unexplained tampering to proved copycat hoaxes, complete with surveillance-camera videotape of one of the perpetrators and multiple arrests. The flap illustrates once again, if a reminder is needed, that there is virtually no limit to the human temptation toward deception. Good for everyone to remember the next time we hear of personal testimonies to crashed flying saucers, abductions aboard UFOs, covens committing ritualistic satanic murders, or any of the myriad alleged psychic-type wonders.

The notorious MJ-12 papers are officially *not official*. Released nearly six years ago by UFO promoters William L. Moore, Stanton T. Friedman, and Jaime Shandera, they were purported to be official U.S. government documents about recovery of crashed flying saucers in New Mexico. They were immediately suspected of being a hoax, and evidence now clearly shows that to be so (see the three articles about this in *SI*, Winter 1987-88, Spring 1988, and Winter 1990, for example). Now the Office of the Secretary of the Air Force has officially designated and stamped on them: NOT AN OFFICIAL USAF DOCUMENT, NOT CLASSIFIED, SUSPECTED FORGERY OR BOGUS DOCUMENT. The process took so long because only the agency that classifies a document has the authority to declassify it. Finally, Philip J. Klass reports in his July 1993 *Skeptics UFO Newsletter*, Col. Richard L. Weaver, Deputy for Security and Investigative Programs in the Office of the Secretary of the Air Force, "decided to bite the bullet and buy an appropriate rubber stamp." Klass nominates Col. Weaver to receive "the USAF's Medal for Outstanding Bravery and Valor Under Deadly Fire."

—*Kendrick Frazier*

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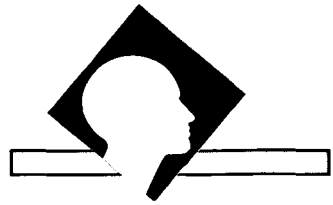
Notes of a Fringe-Watcher



MARTIN GARDNER

☐ *Weird Water, or H_2 Oh!*

How sweet from the green mossy
brim to receive it,
As poised on the curb it inclined to
my lips!
Not a full blushing goblet would
tempt me to leave it,
The brightest that beauty or
revelry sips.

—Samuel Woodworth,
"The Old Oaken Bucket"

We are so familiar with ordinary water that we forget how magical it is. Cool it and it turns into a solid. Heat it and it vanishes into thin air. Under certain weather conditions it becomes snow, with its beautiful crystals. Salt water covers most of the earth's surface, from which it rises as invisible vapor to make clouds. The clouds condense to produce salt-free rain, which in turn fills rivers and lakes. The rivers flow into the sea, and the awesome cycle repeats endlessly. Clearly, life as we know it could not exist without water.

"Be careful with water!" reads one of Ashleigh Brilliant's aphorisms. "It's full of hydrogen and oxygen." Is it not amazing that, when those two gases combine, something emerges, seemingly from nowhere, with totally different properties? "Water-lover" Bloom, in Joyce's *Ulysses* (pp. 442-443), fills almost two pages with poetic musings on the wonders of water.

In view of water's omnipresence, it is hardly surprising that it would be involved, throughout history, with all sorts of preposterous claims. In recent decades there have been two outstanding instances, neither of which turned out to hold water. In 1968 a top Soviet chemist startled the scientific world by revealing tests showing that distilled water, when it condensed in hairlike capillary tubes, turned into "polywater," so called because it acquired a polymeric molecular structure with fantastic properties. Federal agencies squandered millions on polywater research. Hundreds of reports were published in scientific journals before it was shown that polywater doesn't exist. It was nothing more than ordinary water contaminated by human perspiration and silica from glass and quartz containers.

Another much-publicized flap over a peculiar kind of water occurred in 1988, when a French biochemist, funded by a firm that made homeopathic medicines, announced a dramatic confirmation of homeopathic theory. Homeopathic doctors maintain that when one of their drugs is

diluted in water to such a degree that no molecule of the substance remains, the dose somehow becomes extremely potent. The French laboratory claimed that when all the molecules of a certain antibody are removed by repeated dilutions, the water, owing to some unknown process, manages to "remember" the antibody's properties. "Water with a memory" it was called. This watery claim, too, quickly evaporated when serious flaws were found in the French experiments. (See my article on this in the Winter 1989 SKEPTICAL INQUIRER, reprinted with an Addendum in my *On the Wild Side* [Prometheus Books, 1992].)

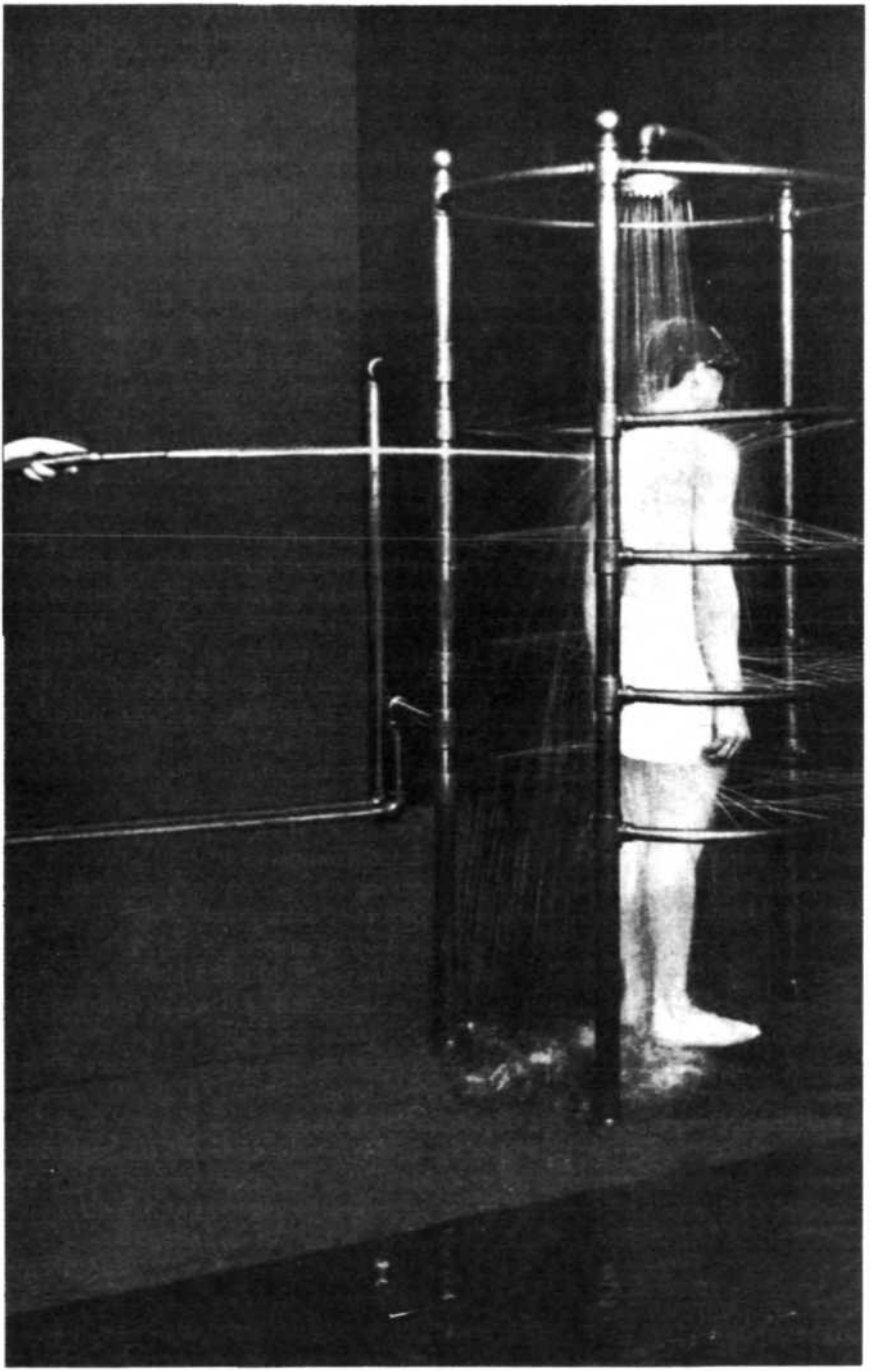
A book would be needed to cover all the spurious claims made in the past for water's curative properties. We all know the medieval legend about the Fountain of Youth, and how it spurred Ponce de León to search for it in Florida. The New Testament (John 5: 2-9) tells of a pool at Bethesda where an angel periodically "troubled the water," giving it the power to cause miraculous cures. Since recorded history, all over the world, certain pools, wells, and springs have been thought to have great healing powers.

During the previous century and the first half of this century, health-giving bottled "mineral water," said to come from natural sources, was widely advertised and sold. Mineral springs, especially those with hot water, were visited by millions of eager bathers. In recent decades companies have made enormous profits selling bottled water to customers who assumed it was free of the chemicals in tap water. In some cases, inspections showed that the bottled water actually came from taps. Perrier's popular mineral water was once found to contain toxic benzene, and the firm was forced to recall 72 million bottles.

The British philosopher Bishop George Berkeley, for whom Berkeley, California, is named, wrote an entire book extolling the healing powers of water contaminated by tar. Holy water, blessed by pagan and Christian priests, has for centuries been taken by believers to have healing properties. Oral Roberts once mailed to his financial contributors tiny vials of water that he and his son Richard had blessed.

Belief in the curative power of ordinary water reached its apex in the 1850s, when hydropathy, or water cure, became a mania in America and Europe. All over the land, especially in New England, water-cure resorts sprang up, charging rates only the wealthy could afford. They were patronized by millions of the ill, including such famous men and women as William James and Harriet Beecher Stowe. Stowe spent ten months at a water-cure resort, and her husband was there later for a year. Hundreds of books promoted hydropathy. There were several impressive journals, notably the popular *Water-Cure Journal*, published by the Fowler brothers, the nation's best-known phrenologists.

A classic crank work, *Rational Hydropathy* (1900), was written by the Seventh-day Adventist (before he was excommunicated) John Harvey Kellogg. The inventor of breakfast cereal, he was founder and head of the famous Battle Creek Sanitarium, in Michigan. My copy, a 1906 third revised edition, is three inches thick, has 1,217 pages, weighs five pounds, and contains 293 illustrations, some in full color. Every known ailment, according to the doctor, can be cured or helped by proper applications of cold, hot, or tepid water. Here is what Kellogg has to say about the sitz bath (bathing in a sitting position with water above the hips):



COMBINED RAIN DOUCHE, HORIZONTAL JET, AND MULTIPLE CIRCLE DOUCHE

From Kellogg's *Rational Hydropathy*, page 473.

> The sitz bath is useful for chronic congestions of the abdominal and pelvic viscera, diarrhea, piles, dysentery, constipation, uterine diseases, and genital and urinary disorders. In treating female diseases it is an indispensable remedy. It is very valuable in various nervous affections, especially those which immediately involve the brain.

Kellogg defined a "douche" as a stream of water aimed at any part of the body. More than 30 different kinds of douches are discussed, with photographs. The soles of the feet, Kellogg wrote, are connected by nerves to the bowels, genitals, and brain. "A short, very cold douche to the feet, combined with strong pressure . . . dilates the vesicles of the uterus, and is hence useful in amenorrhea."

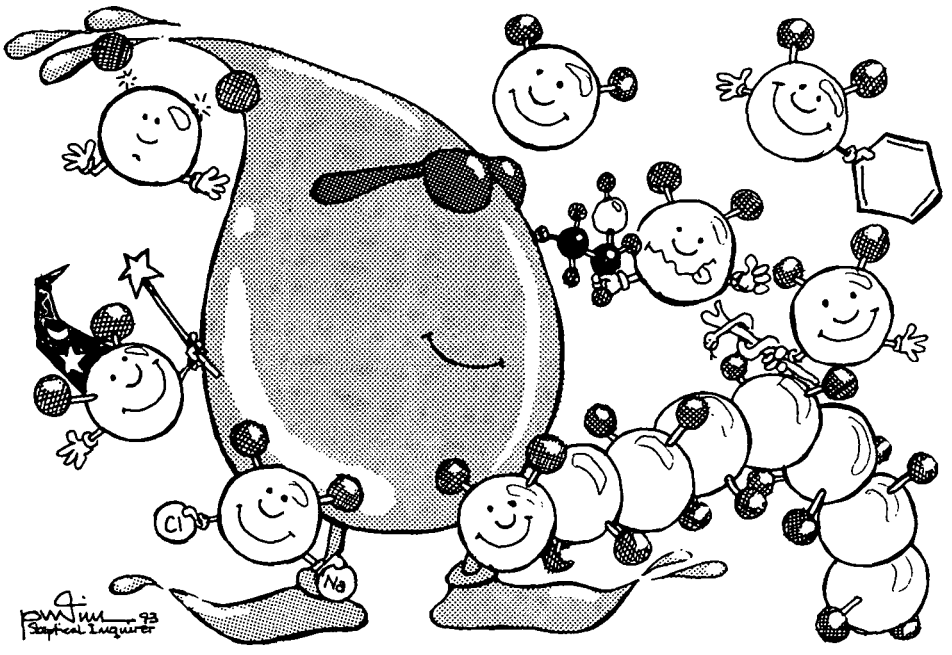
Bathing feet, we are informed, alleviates "headaches, neuralgia, toothache, catarrh, congestion of the abdominal and pelvic organs, colds, and cold feet." How good to know that hot water will warm cold feet! A wet towel wrapped around the body "is a very efficient remedy for constipation, chronic diarrhea, and most other intestinal disorders. It is equally valuable in dyspepsia, torpid liver, enlarged spleen, and uterine derangements."

I am indebted to reader William Carleton for sending me recent literature promoting what it calls "Catalyst Water." In July 1980, Harry Reasoner, on CBS's "60 Minutes" television show, interviewed John Wesley Willard, the inventor of Catalyst Water, and many of his enthusiastic patients in Rapid City, South Dakota. Ingredients in the water's secret formula, Willard said, act as a catalyst, transforming the water into a powerful curative agent. Several people in Rapid City told Reasoner how rapidly Willard's water cured their severe ailments. A farmer insisted his wheat crop greatly increased after he soaked the seeds in Catalyst Water. Giant fruits and plants were shown, allegedly produced by spraying buds with Catalyst Water.

A recent advertising brochure from Lyke and Associates, in Hoffman Estates, Illinois, says that in ten years it has sold more than two million bottles of the water. The price listed is $24.95 per bottle, plus $4.00 for UPS shipping. Dan Vasil, a chiropractor, is quoted in the brochure as saying the "catalyst" alters the water's molecular structure, "making its molecules smaller." This allows them to "penetrate the cell's walls at a much greater rate and carry nutrient to where it needs to be."

Catalyst Water can be imbibed or applied locally to the skin. You can add it to bath water and brush your teeth with it. The Lyke brochure prints stirring testimonials of cures. No addresses are supplied, and a note reveals that "names have been changed to protect privacy." This of course makes it impossible to check authenticity. The testimonials tell how the water cured sinusitis, skin ulcers, liver spots, arthritis, irregular heartbeats, warts, constipation, sore throats, and insomnia. It stopped cataract growth, allowed a diabetic to decrease his insulin, and made a woman's face look younger. Literature from other firms selling the water claims that it grows hair, preserves food, cures cancer in cows, cleans walls and paintbrushes, and unclogs drains.

A phone call to William Jarvis, CSICOP's medical-claims expert, turned up the bizarre history of Catalyst Water. It was originally called "Willard's Water," after its discoverer, who was then a chemistry professor at the South Dakota School of Mines and Technology, in Rapid City. In the



1930s Willard patented a detergent used to clean passenger trains. Later he discovered it had marvelous curative properties for both humans and beasts. He attributed this to the fact that it decreases surface tension, allowing water to permeate cell membranes more readily.

For many years "Doc" Willard sold his water through CAW Industries, CAW being the initials of "Catalyst Altered Water." His son, William J. Willard, eventually took over the firm. After the great boost provided by "60 Minutes," several other firms acquired distribution rights for the water. Domino Chemicals, in New York, called it "biowater." Solvent, Inc., in Kansas City, Kansas, advertised "Willard's Water as seen on CBS '60 Minutes.' " In Fort Lauderdale, Florida, Russ Michael, president of the Fountain of Youth International Trust, published a book about the water called *Miracle Cures*. He puts "Dr." in front of his name because he holds a doctor of divinity degree from the Church of Humanity, which he himself founded.

In 1982, the U.S. Food and Drug Administration (FDA) threw cold water on Willard and his son by refusing to approve their water as medicine. The Willards agreed to stop promoting it as a curative agent. FDA laboratories found that the water, in spite of claims that it used no "chemicals," contained varying combinations of rock salt, lignite, sodium metasilicate, sulfated castor oil, calcium chloride, and magnesium sulfate. The amounts are so small, however, that drinking the water apparently has no baleful effects.

This column would be incomplete without mention of those inventors who every few years announce their discovery of a cheap way to separate hydrogen from oxygen in water. The hydrogen is then used to run engines. The catch is that all methods of splitting water require more energy

than the energy that can be extracted from the hydrogen. If an energy output exceeds input, perpetual-motion machines would be possible.

My random clippings on water-powered motors only scratch the surface. In 1910, John Andrews, a Canadian Navy seaman, claimed he could split water by putting a green powder into tap water. He surfaced again in 1935 to demonstrate his magic powder to the U.S. Bureau of Standards. Two years later he was mysteriously murdered in the basement of his home in Library, Pennsylvania. This suggested to writers obsessed by conspiracies that big car and oil firms had done him in to keep his product off the market.

In 1973, Guido French claimed to transform water into what he called "mota" fuel ("atom" backward), also by using a green powder. Occult journalist Tom Valentine interviewed him for the *National Exchange* tabloid (January 1977). French said he learned his secret formula from a German scientist, but at other times he claimed he got it from spacemen who lived on Neptune. He wanted $250,000 up front to disclose his secret, $10 million in escrow, and one cent per gallon royalty on all fuel sold.

In 1976, Jean Chambrin, in Rouen, France, claimed he could run engines on a mixture of 60 percent water and 40 percent alcohol (*Atlas World Press Review*, December 1975 and February 1976). Archie Blue, in London, extracted $17,000 from three businessmen for a similar scheme (*Toronto Star*, October 12, 1977).

Sam Leslie Leech, of California, generated a surprising amount of media coverage in the late seventies with a machine he called SLX (his initials plus X). It split tap water into hydrogen and oxygen, which could then be used to run cars. Morris Mirkin, a wealthy businessman, bought rights. Morris Shade, a retired Air Force colonel who served as a science advisor to Senator Barry Goldwater, told reporters: "It works. . . . It is such a profound breakthrough in thermonuclear physics that it will astound the world by providing an unlimited energy source." Skeptical physicists were accused of "tunnel vision" (*Science News*, April 24, 1976; *New York Times*, March 29 and April 23, 1976, and July 10, 1978).

In 1990 a firm called the Water Fuel Cell, in Grace City, Ohio, issued a sales manual of several hundred pages about their method of powering engines with tap water. Its manual swarms with biblical quotations foretelling this great breakthrough. In 1992, the *Reno Gazette-Journal* (May 18) reported that physicist Rudolf Gunnerman could run car engines with a 50-50 mix of water and gasoline. What he called "catalytic poles" split the water into hydrogen and oxygen. Plasma physicist Milton Rothman exploded Gunnerman's claims in "Running on H_2O," an article in CSICOP's *Skeptical Briefs* newsletter (September 1992).

The notion that mammoth corporations, fiercely competitive, suppress such inventions is, of course, baloney. It is regrettable enough when the media, ever eager to sensationalize science, publicize miracle-water inventors. It is more tragic when honest but ignorant investors stubbornly refuse advice from knowledgeable physicists, only to find themselves in hot water as their funds dribble down the drain. □

Psychic Vibrations

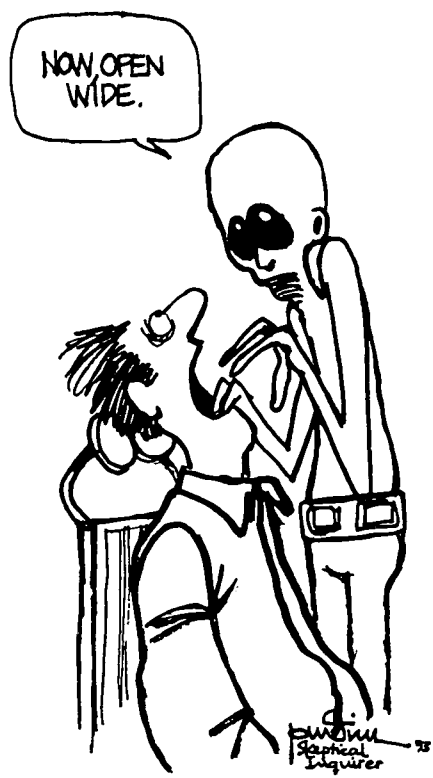
Alien Stigmata, Shy Craft, and a UFO Conference

ROBERT SHEAFFER

The scope of the great saucer crash-and-abduction conspiracy seems to be growing daily. The 1993 movie *Fire in the Sky* recast the 1975 Travis Walton "UFO abduction" story in the mold of the frightening 1990s mutilation-and-death scenario to which Budd Hopkins has accustomed us. However, the film seems to have made little impact on the public, in spite of its sensational eye-gouging scene (a detail Walton himself had neglected to report).

In a related development, William Cone, a Southern California psychotherapist who counsels "abductees," has discovered what he claims is a new stigmata of alien abduction: a hole in the palate of the mouth. Cone cited such blemishes as evidence that alien captors had violated three of his patients with "implants." However, Philip J. Klass suggests in his *Skeptics UFO Newsletter* that Cone would do well to consult *Gray's Anatomy*, which notes that "occasionally there may be a hole in the middle line of the hard palate." The most astonishing news is that of the "Houston mass abduction" reported by Derrel Sims of the Houston UFO Network (HUFON). That group, which had been studying people who claim to have been abducted, scheduled an abductees' panel discussion last December 10. Remarkably, a number of their subjects were supposedly abducted just before the meeting, as if the aliens had wanted to tease the HUFON investigators with extra clues.

"Starting December 8," HUFON reports, "several of the subjects on the panel were reabducted. These abduc-



tions were not realized at the time, but over the next few days, many of the abductees began suffering PAS (Post Abduction Syndrome)." A number of the abductees reported having nosebleeds and/or sinus pains prior to the panel, which UFOlogists claim was caused by their being prodded and violated by extraterrestrial captors, presumably implanting monitoring devices. The meeting on December 10 went well, producing no surprises; but, the morning after, many of the abductees "awoke to find they had nosebleeds during the night." The alien abductors had apparently returned to retrieve what they had recently implanted, and perhaps with it a complete record of the previous day's proceedings. This supposed reabduction was readily confirmed by hypnotic regression. "The significance of this event cannot be overlooked," HUFON notes. "It would appear that the implants were deliberately placed in the abductees before the HUFON meeting and removed the day after."

But pioneer UFO abductee Betty Hill warns in James Moseley's *Saucer Smear* newsletter that many such claimed abductions are "psychological" rather than physical. In real UFO abductions, she explains, "no sexual interest is shown. However, frequently they help themselves to some of our belongings, such as fishing rods, jewelry of different types, eyeglasses, or a cup of laundry soap." Another criterion, explains Hill, is that "no real abductions have resulted in therapy," which, if correct, forces us to rank the story of her own famous "Interrupted Journey" among the bogus.

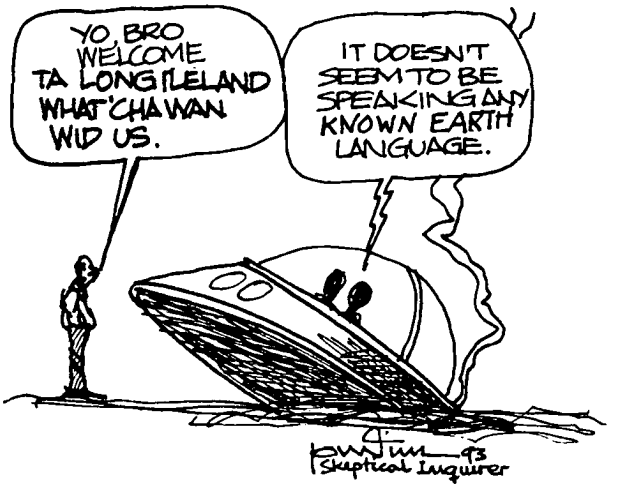
* * *

As for saucer crashes, the most recent incident to come to light occurred not in some remote desert in New Mexico, but in Yaphank, Long Island, a few miles outside of New York City. John Ford, chairman of the Long Island UFO Network (LIUFON), reports that an object was seen to go down on November 24, 1992, at approximately 7:15 P.M. The Suffolk County Police closed some nearby roads, claiming there had been an accident; but this is believed to be part of the cover-up, as some witnesses claim to have actually seen the object impact in a park. Others claim to have experienced bizarre electromagnetic disturbances. Unfortunately, LIUFON reports that its investigation is being hampered by harassment from police officials.

The Center for the Study of Extraterrestrial Ingelligence (CSETI, not to be confused with NASA's SETI program), in Asheville, North Carolina, attempts to make contact with UFO occupants. Steven Greer, director of CSETI, recently dispatched his Rapid Mobilization Investigation Team to Mexico in response to a rash of sightings there. On its third night there, while the group was engaged in Coherent Thought Sequencing (CTS), Greer sensed that he should sit up and look to the right, where he beheld a "structured craft" traveling eastward. He flashed a high-powered light at the craft, which flashed back at him in return. "The group moved into the next field, continuing to signal as the craft made an elegant sweeping right turn and aligned with the field." Unfortunately, the object was "camera shy," for "no sooner was the video turned on when the craft stopped its approach. Although the camera was trained at the brilliant craft, there was no light being registered!"

* * *

In UFO-conspiracy developments, a May UFO conference that may be "the


YO, BRO WELCOME TA LONG ISLELAND WHAT'CHA WAN WID US.
IT DOESN'T SEEM TO BE SPEAKING ANY KNOWN EARTH LANGUAGE.
Skeptical Inquirer

most important event of the year" was held in the tiny desert hamlet of Rachel, Nevada, at least a two-hour drive north of Las Vegas. This unlikely location was chosen because of its proximity to the famous "Area 51" at Groom Lake (see this column, Spring 1992, p. 250), where the U.S. government is said to keep nine alien saucers in secret hangars, attempting to reverse-engineer their engines, perhaps even under the supervision of the aliens themselves. One of the organizers of the conference was Gary Schultz, director of a group known as the Secret Saucer Base Expeditions, based in Southern California. Schultz is convinced that the government is hiding alien crafts at Papoose Lake (10 miles south of Groom Lake) and that a joint technological exchange program of some type is going on among aliens, the military, and a select group of top scientists.

The star of the conference was the reclusive Bob Lazar, who regaled the crowd with wild tales. Lazar claims to be a physicist and that government agents have erased all record of his studies at Caltech and MIT. Lazar says that the saucers' propulsion system is based on Element 115, which has the capability to distort both time and gravity. (When mainstream scientists, who thus far only know of 106 elements, catch up with this discovery, they will no doubt name this miraculous element Lazarium, after its discoverer.) Lazar further claims that in 1979 a military Special Forces officer inadvertently violated security regulations during a meeting with aliens, who immediately "liquidated" him. When other Special Forces agents stormed the room, they, too, were "liquidated," along with 44 government scientists who were unfortunate enough to be watching. However, the deaths of all these persons was easily hushed up. Lazar says, because the government has wisely recruited orphans and loners for such work.

If attendees at the Rachel Conference failed to bring back indisputable photos and evidence of government saucers, it should not be taken as evidence against their claims; rather, conference organizers announced in advance that they had learned from unnamed sources that for security reasons all test flights of alien vehicles were to be shut down from five days before the conference until five days afterward. □

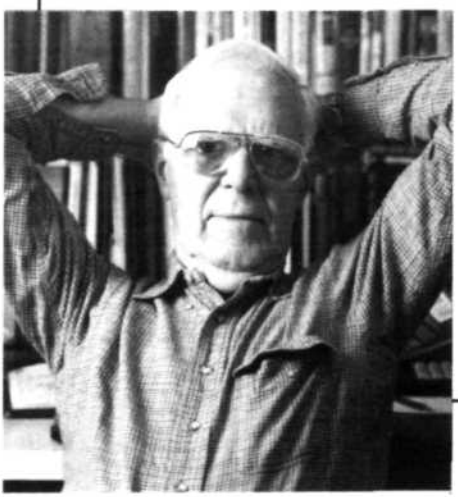
"Crank science books far outsell most books by reputable scientists."

I wrote the words above way back in 1981, in my book *Science: Good, Bad and Bogus.* I think they are still true.

The book is a collection of essays, many of them culled from the pages of the SKEPTICAL INQUIRER. There I dealt with ESP, biorhythms, psychics, and dozens of other fringe-science phenomena.

That was then. This is now. Hardly anyone takes biorhythms, ancient astronauts, or the Bermuda Triangle seriously anymore. I expect that this is at least partly because the SKEPTICAL INQUIRER and its parent, CSICOP, have been doing their work.

Psychics? We have lots more to do there. But we need to work from a position of strength. That's where the Center for Inquiry comes in. The Center, in Amherst, New York (a suburb of Buffalo, 60 miles from Rochester, 80 miles from Toronto, an hour by air from New York City, five hours from California), will be able to dedicate these fea-



Martin Gardner,
co-chairman of CSICOP's
"Price of Reason" Campaign

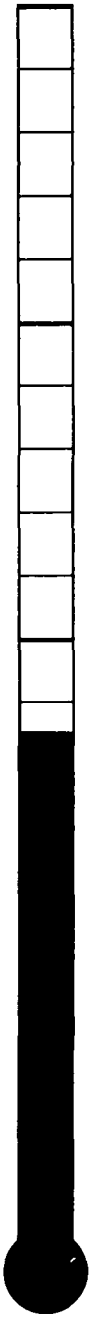
$3.96 million

$3 million

$2 million

$1,720,000

Total raised thus far in gifts, pledges, trusts, and bequests in the Center for Inquiry "Price of Reason" Campaign (a joint project of CSICOP and CODESH) as of August 1993.



tures to the skeptical movement with the success of its "Price of Reason" Campaign:

1. **The world's largest skeptics' library**
2. **Our own seminar, meeting, and conference rooms**
3. **Our own video and audio production center**

The new facility will be adjacent to the Amherst Campus of the State University of New York at Buffalo, the largest campus of the country's largest state university system.

Price: $3.96 million in donated capital. I am proud to be co-chairman of this effort with Steve Allen. We have both given to it. But we can't accomplish our goals without your participation, too.

Please use the postpaid response card in this issue, and let us know how you would like to help out.

Martin Gardner

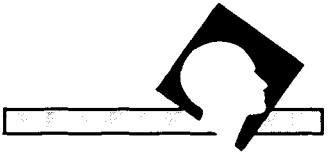
SPECIAL REPORT

'Perspectives on Education in America': Sandia Study Challenges Misconceptions

KENDRICK FRAZIER

If you think that
- —documented declines in SAT scores mean American secondary school students are doing worse
- —American schools are among the worst in the world
- —students are dropping out of school at increasingly alarming rates
- —American schools are graduating fewer and fewer technically trained students

then you might want to reconsider those assumptions in view of an independent systems study of education in America that after three years has finally seen the light of day and been published.[1]



A controversial study has just been published that provides some surprising insights into U.S. education.

During those three years, photocopied summaries of the study were circulating like an underground *samizdat* throughout the educational community. The study, titled "Perspectives on Education in America," was carried out by three scientists at Sandia National Laboratories, Robert M. Huelskamp, Charles C. Carson, and Thomas D. Woodall. It provoked an immediate debate on the status of education. Scores of newspaper columns and editorials have been written about it. Some educators and media commentators have accused government agencies in Washington of delaying or even suppressing the document. The agencies said the report had been undergoing peer review. (It did undergo *additional* peer review at that point). Sandia has received nearly a thousand requests

for the report. Schoolboard members, teachers, and administrators have spoken positively about it at meetings. Many have taken heart from its fresh analyses of the facts and its sometimes surprising conclusions.

Almost all educators familiar with the study have taken the results as confirmation that things aren't as bad as they have often, for whatever reason, been painted. Some Administration officials, on the other hand, argued publicly with the interpretations and worried that the results might lead to unwarranted complacency. For nearly two years, the authors weren't in a position to respond or even talk about their study. Nevertheless they adamantly oppose any suggestion that the study is defending the status quo rather than seeking a fundamental understanding of the facts. Some people felt the culprit in the delays was a former federal administration that, for its own reasons, seemed to want to present public schools in as bad a light as possible. (Some of the best reports on these aspects of the controversy have been written by Julie A. Miller of *Education Week*, for example, May 26, 1993, September 23, 1992, and October 9, 1991.) For its part, Sandia had no axe to grind; it just wanted to present the findings. It certainly wanted no part of any controversy, and this one has caused it considerable pain.

How did the whole thing come about? What about the results is so surprising to those who have been critical of the state of American education?

Sandia National Laboratories, headquartered in Albuquerque, New Mexico, is one of the nation's largest scientific and engineering laboratories. Operated for the U.S. Department of Energy, it conducts scientific research for the U.S. government. It has world expertise in dozens of areas of science and engineering. It increasingly has broad interactions with U.S. industry aimed at strengthening technologies critical to the country's future. As a result of all this, Sandia, the *Perspectives* analysts note, has a "keen interest" in the education system that develops future scientists, engineers, and mathematicians.

"To their surprise, on nearly every measure they found steady or slightly improving trends."

When the Bush Administration in 1989 set forth its National Education Goals and then-Secretary of Energy James Watkins challenged the national laboratories to become more involved in education, Sandia took up the call.

The New Initiatives Department of Sandia's Strategic Studies Center undertook a wide-ranging analysis of secondary-school education systems. The purpose was to see how Sandia might best direct its efforts. The three Sandia systems analysts examined the areas of historical performance, including dropout-retention rates, standardized tests, expenditures, international comparisons, and the status of educators; and of future requirements, including workforce skills, changing demographics, and education goals. To their surprise, on nearly every measure they found steady or slightly improving trends.

The participants told a Congressional subcommittee on July 18, 1991: "The study is producing interesting results. It has greatly changed Sandia's initial perceptions in several of the areas and reinforced others. Overall it provides an objective 'outsider' perspective on the status of education

"If every ethnic or racial population has maintained or generally improved its average SAT score in recent years [and it has], how can the combined average decline during that interval?"

in the United States."

Some of the results may be of particular interest to our readers.

Perhaps the most surprising finding involves standardized tests. The analysts discovered that the much-publicized "decline" in average SAT (Scholastic Aptitude Test) scores among U.S. college-bound high school students misrepresents the true story about student SAT performance. Average SAT scores have declined (about 5 percent) over the past 20 years. The Sandia analysts learned, however, that while it is true that average SAT scores have been declining, the reason for the decline is not decreasing student performance. Following some declines in the 1970s, every minority subpopulation taking the SAT showed general improvement in its average score during the 1980s. At the same time, scores by whites remained stable. (See chart on page 29.)

"This raises an interesting question," they say. "If every ethnic or racial population has maintained or generally improved its average SAT score in recent years, how can the combined average decline during that same interval?

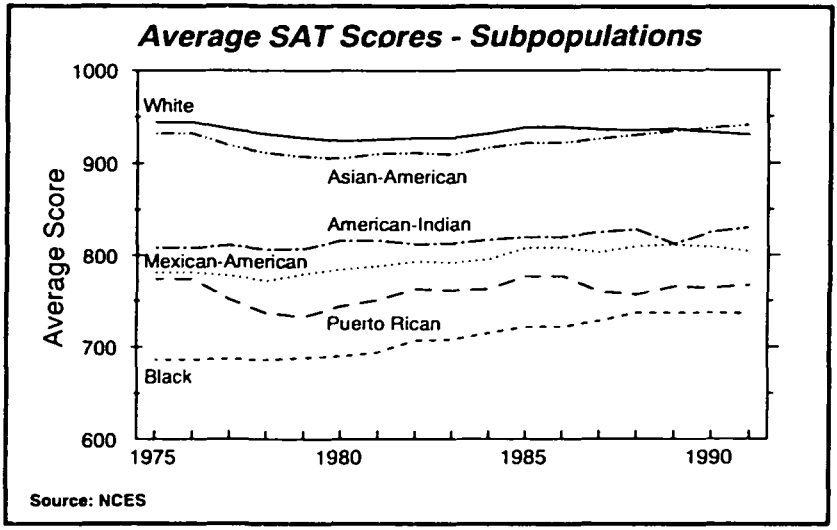
"We found that the decline arises from the fact that more students in the bottom half of the class are taking the SAT today than in years past. Since 1971, the median test-taker has dropped from the 79th percentile in class rank to the 73rd percentile. Additionally, every ethnic group taking the test is performing as well or better today than it did 15 years ago. More people in America are aspiring to achieve a college education than ever before, and the national SAT average is lowered as more students in the third and fourth quartiles of their high school classes take the test.

"This phenomenon, known as Simpson's paradox, shows that an average can change in a direction opposite from all subgroups if the proportion of the total represented by the subgroups changes."

(In an interview in the April *Omni*, mathematics professor and *Innumeracy* author John Allen Paulos cited this same SAT score information as an example of how readily even well-educated people can be fooled by counterintuitive data. In *Innumeracy*, page 41, he gives a somewhat similar example of how a baseball player can lead the league in hitting for both halves of the season yet come in second for the whole season.)

The Sandia analysts found that if SAT scores are controlled for class rank and gender, so that the population of students taking the test matches that of the 1975 test-takers, the average performance of these "traditional" test-takers on the SAT has actually improved by more than 30 points. (They quickly note that this improved score may be misleading too, however, as better test preparation and other nonaptitude factors may contribute to it.) The point, say the Sandia analysts, is that "student performance on the SAT is far too complex to be discussed in terms of decline or improvements in average scores."

Another indicator of education achievement has been the National



From the Sandia report.

Assessment of Educational Progress (NAEP). The Sandia analysts found that the fraction of students scoring at or above a given level has generally remained steady or has increased for all age groups and subject areas. "Although the gains have been modest at best, the national data on student performance do not indicate significant declines in any area."

They hasten to add that they are not implying that the performance levels are adequate for today's or tomorrow's society, only that according to the NAEP assessment, student performance is not in decline.

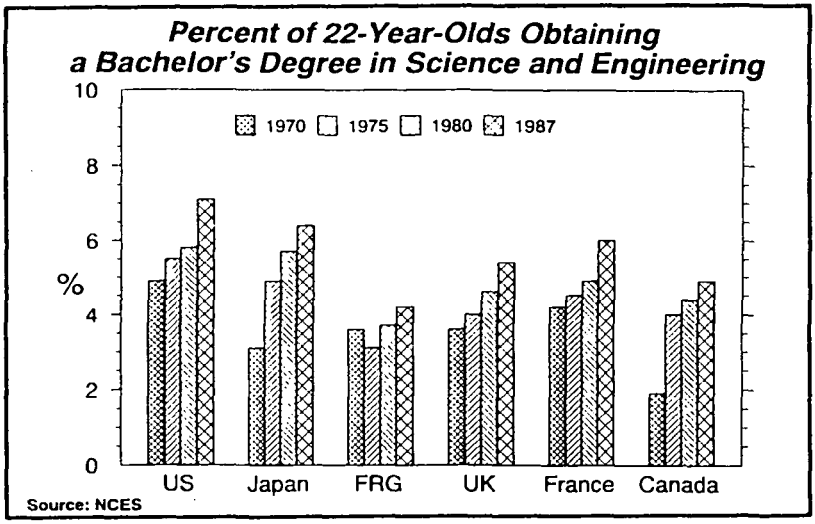
Another key area is dropout assessment.

"Our investigation shows that America's 'on-time' high school graduation rate has been steady for over 20 years at roughly 75% to 80%. However, some students require more than four years to complete high school, and many dropouts avail themselves of opportunities to reenter (GED, night school, etc.), resulting in an overall high school completion rate for young adults of over 85 percent. This rate is improving *and is among the best in the world*" (emphasis added).

Gross numbers can mask underlying problems, however. The Sandia analysts found that the "fine structure" indicates that the most significant dropout problems are among minority youth and students in urban schools. While nearly 80 percent of white students complete high school on time, and 88 percent do so by age 25, minorities do not fare as well.

One encouraging trend is that, with the exception of Hispanics, dropout rates are declining for all ethnicities and community types. One interesting finding is that the lowest dropout rate by far of any such group is among suburban blacks. Suburban blacks drop out at a much lower rate than even suburban whites (6.8 percent compared with 11.8 percent). The high Hispanic dropout rate is troubling. But the study says recent immigration of Hispanics, many of whom come into the U.S. school system with inadequate background to succeed, "is significantly inflating dropout figures for the Hispanic population." This doesn't mean there isn't a serious problem; but it does help point out more precisely where attention must be focused to try to solve it.

On another issue, funding, the analysts found that almost all of the



From the Sandia report.

increase in total average expenditures for secondary and elementary education in the 1980s has gone for special education and for fixed expenses (retirement, social security taxes, and insurance). Expenditures for regular education have remained constant. Special-ed students now account for 11 percent of all students (up from 8 percent in 1977), and they require more than twice the expenditure per pupil as regular students.

Some other findings:

• About three in five (57%) U.S. youths attempt postsecondary studies. This is roughly the high-school graduation rate of the early 1950s. Moreover, they say, this rate is about twice that of Japanese students.

• Approximately one in four persons in the 25- to 29-year-old age group has completed at least a four-year college degree. This rate is nearly the same as the U.S. *high school* graduation rate of the 1930s.

• The percentage of 22-year-olds obtaining bachelor's degrees in the natural sciences and engineering was rather stable from 1960 to 1980, at nearly 4 percent. The 1980s data indicate that youth today are choosing science and engineering degrees at a much higher rate than their peers in the 1960s.

• From 1977 to 1987, the total number of bachelor's degrees awarded to U.S. citizens in math, computer science, physical science, and engineering rose more than 75 percent, from roughly 90,000 degrees in 1977 to 155,000 in 1987. (The increase among males was 70 percent; among females, 200 percent.) "As a national laboratory, we were particularly interested in possible shortages in technical-degree attainment. To our surprise, we found that about 200,000 U.S. students earn technical bachelor's degrees each year, up significantly from 20 years ago, but representing a fairly steady rate of 4-5% of U.S. youth getting degrees in natural science and engineering."

On international comparisons:

• "We found little credible data on international comparisons of education." Differences in educational goals, philosophy, and culture make meaningful comparisons very difficult. In the U.S. the democratic value of "education for all" is a goal; in other countries there may be much more

"weeding out" at earlier ages. "Based on the sparse data available . . . , average U.S. student performance continues to be low in both math and science, compared to other participants. The major differences in education systems and cultures across countries diminish the value of these single-point comparisons."

• "Other international indicators of education-system performance reflect well on the U.S. Only Belgium and Finland exceed the U.S. in the percentage of 17-year-olds enrolled in school."

• "The U.S. continues to lead the world in the percentage of young people obtaining bachelor's degrees and in the percentage of degrees obtained by women and minorities. This is true for both technical and nontechnical degrees. The U.S. also has the most balanced male/female ratio for both technical and nontechnical degrees." In the United States, in fact, women now earn more bachelor's degrees than men do, and this trend could soon extend to graduate degrees.

• "Our comparison of technical workforces reflected well on the U.S. education system. Although the United States lags behind other countries in certain specialties (such as industrial engineering), the overall technical and nontechnical degree attainment by the workforce and population as a whole is unparalleled in the world."

The Sandians conclude by identifying five primary challenges facing education today:

—Forming a national consensus and finding leadership in educational improvement ("extremely difficult" because education "has so many stakeholders")

—Improving the performance of minority and urban students

—Adjusting to demographic changes and immigration

—Improving the status of elementary and secondary educators: "Much of the blame for problems in education, real and imagined, has been placed on local teachers and administrators. This has resulted in feelings of low self-esteem and bitterness. . . ."

—Upgrading the quality of educational data: "The available data . . . are often used by decision makers in unintended, and sometimes inappropriate, applications. The use of inappropriate, simplistic, or highly aggregated data will most likely result in poorly focused actions, with disappointing outcomes." The report, while emphasizing that the U.S. education system faces serious challenges, criticizes "counterproductive rhetoric" based on simplistic data and anecdotes. "Much of this rhetoric is a distraction that diverts the nation's focus away from real [education] problems."

Note

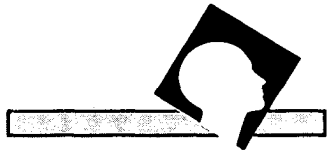
1. Charles C. Carson, Robert M. Huelskamp, and Thomas D. Woodall, "Perspectives on Education in America." *Journal of Educational Research*, 86(5):257-312, May-June 1993 (entire issue). Copies of the Sandia report are available for $9.50 from the *JER*, Heldref Publications, 1319 18th St. NW, Washington DC 20036-1802. A summary of the report, by Huelskamp and with the same title, was published in the May 1993 *Phi Delta Kappan*, the professional fraternity in education.

Kendrick Frazier is Editor of the SKEPTICAL INQUIRER. He is also a member of the staff of Sandia National Laboratories and has delayed writing about this report and controversy until it was published.

Do 'Honesty' Tests Really Measure Honesty?

SCOTT O. LILIENFELD

Laypersons and scientists alike have long been intrigued by the prospect of developing a foolproof technique for assessing deception (Lykken 1981). Perhaps because lying is so prevalent in our daily experience (Saxe 1991) and because humans are such fallible lie detectors (even the most perspicacious among us are capable of distinguishing truths from falsehoods no more than about 70 to 85 percent of the time [Ekman 1985; Lykken 1981]), the public has maintained a fascination with methods purported to detect dishonesty with essentially perfect accuracy. Nevertheless, for decades the validity of such methods has been an ongoing source of controversy among researchers (e.g., Lykken 1979; Raskin and Podlesny 1979). In this article, I focus upon what has recently become the most widespread and lucrative technology in the detection-of-deception industry: the use of self-report "honesty" questionnaires for pre-employment screening.



Self-report "honesty" tests are misnamed and appear to suffer from some of the same shortcomings that have plagued the polygraph test and other standard lie-detection methods.

Overview of "Honesty" Techniques

Most of the early efforts to assess dishonesty were predicated upon the existence of a "Pinocchio response"—a supposed observable reaction that always occurs while telling lies but never at other times. Undoubtedly the greatest amount of public and scientific attention has focused upon the polygraph, or "lie detector," test, which has often been used by companies to identify individuals responsible for theft and other crimes in the workplace. In addition, the polygraph test has frequently been utilized as a pre-employment screening device to detect potential employees with a history of criminality

(Lykken 1981). The polygraph test was invented by William Marston, whose other major creation was the comic-book character "Wonder Woman," who induced criminals to tell the truth by encircling their waists with a magical lasso. The standard polygraph test compares subjects' autonomic responses, such as their heart rate, respiration, and palmar sweating, to "relevant" questions ("Did you rob the bank?") with their autonomic responses to "irrelevant" questions ("Were you born in the U.S.?"). Many variants of the polygraph test also include "control" questions designed to gauge the subject's autonomic responsitivity to known lies (Lykken 1981). Subjects who consistently exhibit more pronounced autonomic reactions to relevant questions compared with other questions are presumed to have given dishonest responses to the former.

Nevertheless, as there is no scientific evidence for a specific autonomic lie response (Lykken 1981; but see Bashore and Rapp 1993 for a discussion of the potential use of brain electrical activity in lie detection), the polygraph test rests upon an untenable assumption. Because autonomic arousal can stem from a variety of sources, including surprise, anger, fear, disgust, guilt, and even amusement, individuals can exhibit more elevated autonomic responses to relevant questions than to other questions for a multitude of reasons other than lying. Thus the polygraph test suffers from what Ekman (1985) has termed the "Othello error," after the tragic Shakespearean character who mistook his wife's distress at his accusations as proof of her infidelity—namely, the error of interpreting arousal as evidence of deceit (also see Shneour 1990). For example, a subset of innocent subjects, sometimes referred to as "guilt-grabbers," appear to exhibit elevated autonomic responses to relevant questions as a consequence of an overly harsh conscience. Such people often show marked physiological arousal following questions like "Did you strangle

"Like the polygraph, many honesty tests, paradoxically, may penalize particularly moral individuals, many of whom may be the 'guilt-grabbers' erroneously detected by the polygraph test."

your boss?" not because they are guilty of the act, but rather because they feel guilty for having entertained thoughts of doing so. Thus the "lie detector," paradoxically, may detect excessively guilt-prone individuals, who are probably among the least likely of all people to prevaricate.

Because autonomic arousal is not a specific indicator of lying, the polygraph test typically yields a high rate of *false positives* (Lykken 1981); in less technical terms, the test mistakenly classifies a large number of innocent individuals as guilty. In addition, there is suggestive evidence that the polygraph test yields a nontrivial rate of *false negatives*—guilty individuals mistakenly classified by the test as innocent. For example, psychopathic personalities, who lack a well-developed conscience and experience low levels of fear, may often "beat" the lie-detector because of their low autonomic reactivity (Lykken 1978; cf. Patrick and Iacono 1989).

A variety of other methods have similarly been heralded as essentially infallible indicators of either truths or falsehoods. One technique that has long captured the public's imagination is the administration of so-called "truth serum," or sodium amobarbital (amytal), a barbiturate sometimes given during psychiatric interviews to uncover memories that the individual is unwilling or unable to reveal (Schatzberg and Cole 1986). There is no evidence that this so-called truth serum increases the probability of honest responding, and it seems likely that amytal simply lowers the threshold for reporting virtually all memories, both accurate and inaccurate. Popular misconceptions notwithstanding, hypnosis appears no better at recapturing veridical memories (Hilgard 1981). Voice stress analysis (Ekman 1985; Klass 1980), measures of pupillary diameter (Lykken 1981), graphology (Furnham 1988), "fidgetometers" (i.e., chairs measuring the extent to which subjects squirm during interrogation [Lykken 1981]), and numerous other methods for distinguishing honest from dishonest responses, suffer from the same dubious assumption that is the Achilles heel of the polygraph—the existence of a Pinocchio response. Not surprisingly, they have all been found to be poor indices of deception.

The New Frontier: Self-Report Honesty Tests

The growing recognition of the deficiencies of the polygraph test and of similar measures has led to intensified public and scientific pressure to place tight restrictions upon their use. Several state laws limit polygraph use (Sackett, Burris, and Callahan 1989), and the 1988 Federal Polygraph Protection Act banned most uses of the polygraph in the private sector. In response, an increasing number of organizations seeking an alternative to the polygraph have turned to questionnaire measures of honesty. Unlike the polygraph, which is usually administered to ascertain whether an individual is dissembling on a particular occasion, honesty tests are intended to assess whether individuals possess high levels of the *trait* of honesty (but see Hartshorne and May

1928 and Mischel 1968, for criticisms of the concept of an honesty trait). By a trait, psychologists typically mean an enduring disposition that is relatively stable across many situations. Honesty tests are typically used by companies to detect prospective employees at high risk for dishonest or so-called counterproductive behaviors (stealing, falsifying time-cards, goldbricking, taking long lunch breaks, making unauthorized telephone calls). More rarely, these tests are also administered to current employees (Camara and Lane 1992).

The desire of companies to detect would-be employees who may be prone to thievery and related behaviors in the workplace is certainly understandable. Estimates of the amount of money lost to employee theft and other defalcations in the United States range from $5 billion to $200 billion annually, with most estimates in the $40-billion range (Murphy 1993). In one recent survey, 62 percent of workers in the fast-food industry confessed to pilfering money or merchandise during their previous six months on the job (Slora 1991); comparable rates have been reported for a number of other businesses. Moreover, it has been estimated that approximately 30 percent of new companies fail as a result of employee theft (Morgenstern 1977).

The increased state and federal prohibitions on polygraph use, coupled with the need to control employee dishonesty on the job, have led to a marked upsurge in the use of self-report honesty measures. At least 5,000 companies administer honesty tests to approximately 5 million people every year (Sackett and Harris 1984). This makes them among the most frequently administered psychological tests in the United States. Moreover, in many organizations honesty tests have essentially become a substitute for the polygraph test. Indeed, many of these tests, such as the Reid Report (e.g., Ash 1975), have been developed by polygraph firms (Sackett et al. 1989). With few exceptions, honesty tests have been constructed by nonpsychologists who have no formal training in psychological assessment, test development, measurement, or statistics. For example, the Phase II profile, which has been administered to well over one million people, was developed by a former police officer with no background in psychological testing (Paajanen 1988).

"We found that a group of 41 monks and nuns obtained significantly lower *(i.e., 'more dishonest') scores on the Reid Report punitiveness items than a group of 226 college students, and even scored lower (although not significantly) than a group of incarcerated criminals."*

Although a large number of honesty tests are currently on the market (see Sackett and Harris 1984, and Sackett et al. 1989), most are quite similar. Most honesty tests, for example, contain items assessing admissions of prior theft (e.g., "Have you ever stolen merchandise from your place of work?"). The rationale is that people who admit to having stolen in the past are at increased risk of stealing in the future. Another set of questions assesses attitudes and thoughts concerning theft and related behaviors (e.g., "Have you ever been tempted to steal a piece of jewelry from a store?"). The assumption here is that people who admit to frequent

temptations are at heightened risk of succumbing to these temptations in the future.

Other items measure one's perceptions regarding the dishonesty of others (e.g., "Do you think that most people steal money from their workplace every now and then?"); a "true" response is scored in the direction of dishonesty. These questions are based upon the assumption that dishonest individuals tend to believe that most other people are similar to themselves (Goldberg et al. 1991).

Still other items assess what is sometimes referred to as "punitiveness"—the extent to which a person endorses strict punishments for others' misbehaviors (e.g., "A person has been a loyal and honest employee at a firm for 20 years. One day, after realizing that she has neglected to bring lunch money, she takes $10 from her workplace, but returns it the next day. Should she be fired?"). A response of "No" to such items is considered an indicator of dishonesty; the premise here is that dishonest individuals are less willing to favor punishments for persons like themselves (Lykken 1992).

Nevertheless, the assumptions behind many honesty-test items appear to be questionable. For example, items assessing admissions of past wrongdoings and items assessing temptations to misbehavior may reward respondents who consciously attempt to create a favorable impression, and punish those who are honest, open about their faults, and introspective (Lykken 1992). Thus, like the polygraph, many honesty tests, paradoxically, may penalize particularly moral individuals, many of whom may be the "guilt-grabbers" erroneously detected by the polygraph test. Although relatively little research has been conducted to evaluate this possibility, one of my graduate assistants and I (Andrews and Lilienfeld 1993) have found that college students with high ("more honest") scores on several commonly used honesty measures obtained slightly *lower* scores on a well-known measure of moral reasoning, Rest's Defining Issues Test (Rest 1979). Items assessing individuals' perceptions concerning the dishonesty of others may reward respondents who hold a naive and Polyannaish view of the world (Lykken 1992) and punish those who are "street smart," are perceptive regarding others' shortcomings, or live in areas where crime is rampant. Finally, the "punitiveness" items may reward respondents who are authoritarian and rule-bound and punish those who are forgiving and flexible.

Preliminary support for this latter conjecture derives from analyses we have recently conducted (Andrews and Lilienfeld 1992). Specifically, we found that a group of 41 monks and nuns obtained significantly *lower* (i.e., "more dishonest") scores on the Reid Report punitiveness items than a group of 226 college students, and even scored lower (although not significantly) than a group of incarcerated criminals. These findings raise the possibility that punitiveness items are biased against those who have been taught to preach and practice charity (also see Guastello and Rieke 1991 and Lykken 1981).

The claims made by many honesty-test publishers range from the unintentionally humorous to the plainly deceptive. The publishers of the Reid Report, for example, distributed an advertisement headlined "After years of catching thieves with the lie-detector, we've perfected a way to catch them with paper and pencil" (Lykken 1981). Other honesty-test publishers proclaim that their tests have been demonstrated to identify the majority of individuals who sub-

sequently engage in theft, but they neglect to report the proportion of innocent individuals who are mistakenly classified as likely to steal (i.e., false positives). Detecting in advance all individuals who will engage in theft is no great accomplishment; a simple reductio ad absurdum shows why. By predicting that every employee will steal, one could successfully identify 100 percent of future thieves. In another case, the institutional affiliation of a researcher employed by a test publisher was listed as the well-known university at which he obtained his doctorate 30 years earlier, rather than his present affiliation (Sackett et al. 1989). The blatantly overblown and sometimes deceitful assertions of a number of honesty-test publishers might lead an impartial observer to wonder whether such publishers would succeed in passing their own tests.

Research on the Validity of Honesty Tests

Despite the increasingly widespread use of honesty tests, there is little adequate research on their *validity*—the extent to which they assess what they are purported to assess. Moreover, little consensus exists on the constructs, or underlying psychological attributes, assessed by honesty tests. Among the constructs honesty-test publishers claim their tests measure are honesty, integrity, counterproductivity, employee deviance, wayward impulses, organizational delinquency, absenteeism/tardiness, dependability/conscientiousness, theft-proneness, emotional stability, job performance, predictiveness, service orientation, and stress tolerance (Camara and Lane 1992). This proliferation of terms reflects pervasive confusion regarding what honesty tests measure.

"Most of the research on the validity of honesty tests has been performed by researchers directly affiliated with test publishers, who possess a vested interest in obtaining and reporting positive findings on their own measures."

The claims of test publishers aside, do honesty tests predict counterproductive behaviors in the workplace? A major difficulty with conducting research on the validity of honesty tests is that the scoring keys for most of these tests are proprietary; they are not in the public domain and can be obtained only with the permission of the test publisher. Independent investigators who wish to conduct research on proprietary tests must have their research proposal "approved" by the publisher. There is of course no guarantee that this approval process is impartial; in our experience, we have found that some publishers reject proposals aimed at subjecting their tests to close scrutiny. Consequently, most of the research on the validity of honesty tests has been performed by researchers directly affiliated with test publishers, who possess a vested interest in obtaining and reporting positive findings on their own measures.

Moreover, the proprietary nature of most honesty tests makes objective evaluation of the research on their validity difficult or impossible. Research on honesty testing is especially susceptible to the "file-drawer problem" (Rosenthal 1979)—the tendency of negative findings to remain unpublished. The file-drawer problem

may contribute to a favorable but misleading evaluation of a test's validity. For example, Ones, Viswesvaran, and Schmidt (1991) recently used meta-analysis (a statistical technique for summarizing the results of studies) to conduct a comprehensive review of validity research on honesty tests. They reported that honesty tests tend to have moderate levels of validity for a number of criteria, such as theft on the job. Nevertheless, it is difficult to interpret the results of Ones et al.'s review because the majority of studies included in their analyses were conducted "in-house" (i.e., by test publishers), and the authors made no attempt to correct for the possibility that negative findings on honesty tests were selectively withheld.

Setting aside for a moment the file-drawer problem, what do the published data on the validity of honesty tests indicate? One piece of evidence often cited in support of their validity is that convicted felons tend to receive lower scores on such tests (note: low scores on honesty tests are in the direction of greater "dishonesty") than do individuals in the general population (Goldberg et al. 1991). Nevertheless, it should come as no great surprise that felons, many of whom are incarcerated for theft, report more instances of theft and more frequent thoughts about theft compared with the average person. Thus such data do not provide particularly compelling support for the validity of honesty tests.

A number of researchers have found that scores on honesty tests correlate negatively with admissions obtained from polygraph examinations, as well as with the results of these examinations. Nevertheless, these findings are flawed in two major respects. First, admissions derived from polygraph tests are highly problematic, because a substantial number of guilty subjects may not confess to wrongdoing. Consequently, the use of polygraph-elicited admissions may detect only those individuals honest enough to confess to minor misbehaviors, who in turn may be the same individuals who confess to such misbehaviors on honesty tests. The second problem with the polygraph studies is similar: because many individuals who fail the polygraph test are innocent, a correlation between honesty tests and the results of polygraph examinations may indicate only that the same innocent subjects ("guilt-grabbers"?) are misclassified by both tests.

Other studies reveal that honesty-test results are negatively correlated with admissions of theft and related behaviors obtained from self-report measures. These studies are unconvincing, however, for the same reason that renders the studies of admissions elicited during polygraph tests suspect: honest individuals may be especially likely to confess to minor wrongdoings, resulting in a spurious correlation between honesty-test results and admissions of wrongdoing. In addition, because many honesty tests themselves contain questions eliciting admissions of theft, this correlation may simply be a result of content overlap between the two measures.

Other researchers have examined the relation between the introduction of honesty tests in the workplace and institutional "shrinkage"—the loss of money ostensibly stemming from employee theft. The results of several studies indicate that once an organization begins to screen potential employees with honesty tests, shrinkage decreases (Sackett et al. 1989). Nevertheless, such studies are fatally flawed in one major respect—they lack a control group that did not receive

the honesty test. This makes it impossible to attribute definitively the cause of the shrinkage reduction to the introduction of the test. Even with a control group, reductions in shrinkage may result from a number of factors unrelated to honesty tests themselves, such as perceived changes in an organization's attitudes and policies toward theft.

Superficially, the most persuasive support for the validity of honesty tests comes from studies examining their ability to predict counterproductive behaviors in the workplace. In general, honesty tests have been found to forecast theft and related misbehaviors in the workplace at better than chance levels (Goldberg et al. 1991). But the magnitude of these predictive correlations tends to be quite low; most are in the 0.1 to 0.3 range, indicating that honesty tests account for between roughly 1 to 9 percent of the differences among individuals in job-related dishonesty (one obtains these percentages by squaring the correlations). The remaining 90 percent or more of these differences typically remain unpredicted by honesty tests. Moreover, honesty tests yield a very high false positive rate. Using the cut-offs recommended by test publishers, between 73 and 97 percent of individuals who receive failing scores on such tests are not found to later commit theft on the job (Office of Technology Assessment 1990, cited in Guastello and Rieke 1991).

Interestingly, most honesty tests have been found to be moderately *positively* correlated with questionnaire measures of lying (for which high scores indicate a greater probability of lying); that is, individuals with "more honest" scores on honesty tests paradoxically tend to receive "more dishonest" scores on measures of lying (Guastello and Rieke 1991).

"There has been virtually no research on the issue of fakability, leaving open the possibility that a number of high scorers on honesty tests are 'seeing through' the test and consciously creating a favorable impression."

These latter measures contain items assessing denial of common or everyday frailties ("I occasionally make mistakes in my work," "I sometimes get more upset about things than I should"); subjects who deny a large number of such human frailties can generally be assumed to be dissimulating. The positive correlation between honesty tests and measures of lying is problematic, because individuals with higher levels of honesty would presumably be expected to admit to more trivial faults shared by virtually all of humanity. Instead, this finding again raises the possibility that honesty tests penalize individuals who are frank and introspective.

A related issue that has received surprisingly little attention is the extent to which honesty tests are susceptible to attempts at "faking good." Many of the items on these measures are highly "face-valid," meaning that most respondents can easily discern what answers will make them appear honest. Nevertheless, there has been virtually no research on the issue of fakability, leaving open the possibility that a number of high scorers on honesty tests are "seeing through" the test and consciously creating a favorable impression. Although a prominent proponent of

honesty testing has asserted that "in fact, ['faking good'] does not seem to happen" (Ash 1975: 141), he provided no evidence to substantiate his claim. In an attempt to deal with the potential problem of fakability, some organizations have developed "disguised-purpose" honesty tests (Sackett et al. 1989; Murphy 1993). These tests consist primarily of items ("I would do almost anything for a thrill," "I usually enjoy watching a good brawl") that assess personality traits putatively related to dishonesty (e.g, impulsivity, aggressiveness). The extent to which such tests can circumvent the shortcomings of more traditional "clear-purpose" tests (Murphy 1993) remains to be seen. Similarly, no research has been conducted on the extent to which people can be *trained* to beat honesty tests; if such tests were highly susceptible to training, they would presumably be at risk of becoming obsolete soon after the formula for passing them became widely known.

Reprise: Do Honesty Tests Really Measure Honesty?

What can we say in response to the question constituting the title of this article? It appears that honesty tests assess a variety of characteristics largely or entirely unrelated to honesty, and are thus misnamed. Low scores on these tests probably reflect dishonesty in some cases, but they may just as often reflect other traits, such as street-wiseness, charity toward others, and extreme honesty (!) and openness concerning one's temptations and history of peccadillos. The Reid Report correlates positively with a number of characteristics not traditionally considered important to the construct of honesty, such as freedom from stress, desire for interpersonal intimacy, fearfulness, and traditionalism (Lilienfeld, Andrews, Stone, and Stone, in press). Such findings raise the possibility that honesty tests may systematically exclude certain persons from some occupations because of their standing on personality traits that are irrelevant to honesty.

Moreover, honesty tests seem to suffer from many of the same liabilities that have bedeviled the polygraph test and other standard methods of lie detection. Honesty tests, like the polygraph, yield a high rate of false positives. Ironically, many of the innocent individuals mistakenly identified as dishonest by both of these procedures may be especially moral people whose strong consciences lead them to take these tests more seriously and conscientiously than does the average person. In addition, both honesty tests and polygraph tests may yield a significant number of false negatives. Equally ironically, many of the guilty individuals missed by both procedures may be people whose absence of a strong conscience allows them to beat these tests with equanimity. Thus honesty tests, which in large measure are the progeny of polygraph tests, appear to have inherited many of their ancestors' deficiencies. Unless these shortcomings can be remedied, honesty tests seem destined to go the way of the polygraph and the other pseudoscientific dinosaurs of the lie-detection industry.

Note

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Astrology Strikes Back—But to What Effect?

GEOFFREY DEAN

In two new books, pro-astrology authors strike back at nonbelievers. The blurb on Robert Parry's book, *Astrology's Complete Book of Self-Defence*, promises "a carefully argued defence against all possible attack" based on "great depth of research." The dustjacket on John Anthony West's hardcover, *The Case for Astrology*, says, "Sceptics will never lightly dismiss astrology again," while on the paperback version Colin Wilson calls it "the most serious and important study of astrology ever written." The implication is that convincing new evidence in support of astrology will be revealed. What actually happens is the selective reporting of dated studies with a relentless blind eye for crucial issues.

Two new books promise to reveal convincing new evidence for astrology, but their attacks on criticisms are based on selective reporting of dated studies and a blind eye for crucial issues.

In the first book, Parry aims to provide believers with a defense against attack by critics. The first of three parts (42 pages) looks briefly at astrology's popularity, techniques, history, and types of astrology (pop, hobbyist, semi-pro, pro). Part 2 (97 pages) is the defense proper.

According to Parry, there are 12 main attacks on astrology, as follows. His defense is in parentheses, with my occasional comment in italics.

1. Sun-sign astrology is nonsense. (Agreed, he says, it is not real astrology, but journalism.)

2. Free will makes astrology nonfalsifiable. (Free will is part of astrological philosophy.)

This evades the issue.

3. Astrology is a heathen superstition. (Many astrologers are practicing Christians.)

4. Astrology is old-fashioned and irrelevant. (It is widespread and popular.)

5. Few accurate world predictions are made. (Many are successful.)

This is meaningless, because no allowance is made for chance hits.

6. People born at the same moment do not lead similar lives. (Some do.)

Ditto.

7. Tropical signs ignore precession. (Precession is not important.)

Eastern astrologers would disagree.

8. Astrology should be based on the moment of conception. (But the birth moment works.)

This is contradicted by controlled studies; see later.

9. Earth-centered views are out of date. (They are merely a convenience.)

10. Astrologers ignore new planets. (They do not.)

11. Gauquelin says induction ruins astrology. (Most astrologers disagree.)

12. Planets cannot affect us. (Extraterrestrial influences exist.)

See below.

Part 3 (41 pages) offers advice to astrologers for assuring astrology's future: They should avoid weirdness, extremism, testimonies, ego-tripping, and reductionist statistics. And they should always be lawful, informed, and humble. This admirable message is then negated by Parry's closing advice, namely, that they should never doubt the worth of astrology and should walk in pride. The book ends with references, a glossary, addresses, a reading list, and an index.

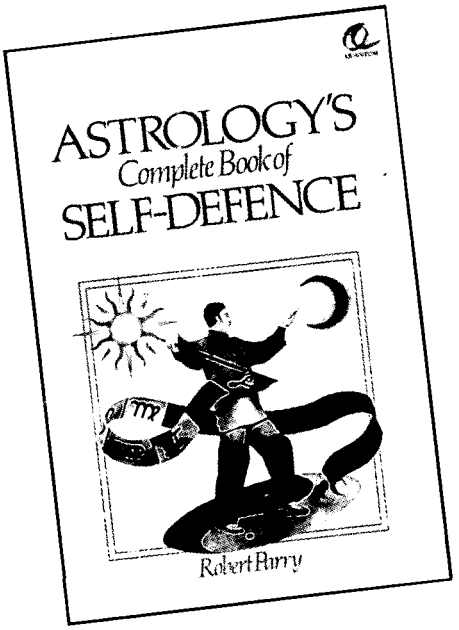
What of the empirical evidence for astrological claims? Parry first cites indirect evidence, such as the Piccardi effect and alleged lunar effects on oysters. (Lunar effects on oysters may be illusory. See Paul Quincey's article in *SI*, Winter 1993, and J. T. Enright's letter in *SI*, Summer 1993. Both strongly dispute the alleged effect.) Parry argues that such supposed extraterrestrial influences prove that astrology is credible, which is like arguing that money exists, therefore everyone is rich. As pointed out by Kelly et al. (1989) in their response to pro-astrology arguments, it is a huge jump from such influences to the claims of astrologers. If there really was a connection, then we would expect planets to have added to our understanding of living organisms in the same way that, say, genes have. But they have not.

Astrology's Complete Book of Self-Defence. By Robert Parry. Quantum (an imprint of Foulsham), Slough, U.K. 1990. 224 pages. Paper, £7.95.

The Case for Astrology. By John Anthony West. Viking Penguin. 1991. 527 pages. Cloth, £20.00. Paper (1992), £8.99.

Parry then cites alleged direct evidence, mainly Nelson (forecasting shortwave radio propagation), Gauquelin (planetary links with occupation and heredity), and matching tests of astrologers (as in "pick the murderer's birth chart"). This evidence is seriously out of date, and Parry seems unaware that much of it has been overturned by recent studies. Furthermore, Gauquelin's negative results (no support for signs, aspects, and transits) are ignored, and the support from his positive results is overstated: Astrology does not predict that only half the planets work for eminent people and none for ordinary people; it predicts weakness not strength for the favored positions, and the effect sizes are trivial. In short, Parry's evidence for astrology is no evidence at all.

Worse still, having promised "a carefully argued defence against all possible attack," Parry's book ignores two problems that effectively pull the plug on any defense. First, astrological claims (albeit not the Gauquelin effect) are readily explained by the perceptual, inferential, and small-sample biases to which people in general, and astrologers in particular, are abundantly prone (see Dean et al. 1992).



For example, knowing that Scorpios are supposed to be secretive, our observations will invariably confirm it, simply because everyone is secretive at times and we are disinclined to test non-Scorpios. Second, even if the first is disregarded, the effect sizes and reliabilities of astrologers' judgments are still trivial (see Dean 1987). So even if we grant that astrology is not an illusion, it still behaves like one. Direct comparisons of effect size show that orthodox techniques for predicting personality, intelligence, and work performance are far superior to astrology (see Dean 1992).

To put it another way, as pointed out for parapsychology by Glymour (1987), no sensible person will opt for a paranormal explanation of tiny effect sizes. Tiny changes in experimental outcomes can be due to a huge number of ordinary causes, most of them impractical to control even if known. So a sensible person will say that, as long as the effect is tiny, it is more probably due to some combination of ordinary causes. For astrology to be plausible, what is needed is not tiny effect sizes but Big Stuff that nobody can ignore, like guessing sun signs with perfect accuracy all the time.

There is a further problem with Parry's book. An adequate defense of astrology must first recognize that astrology can be broadly viewed as either art, religion, or science. Consequently it means different things to different people. As art, the symbolism of astrology can greatly enrich poetry, paintings, and plays. As religion it can meet the spiritual needs of believers. As science it can be viewed as a source of presumed *benefit*, for example, by providing a focus for conversation, or by meeting our need to conform and yet feel unique; and as a source of presumed *knowledge*, for example, "Moon-Saturn indicates early problems in childhood with your mother." The point is that only the last qualifies for the kind of defense involved here. Let me explain.

If I am freaked out by this painting of Taurus at bay, or by Shakespeare's use of astrological symbolism, or by zodiacal iconography inside a church, or if I am spiritually uplifted by the writings of Dane Rudhyar, or if I gain insight into my behavior by studying horoscopes, or if I find a special closeness to women with Ophiucus rising, or if I find it more rewarding to circulate at cocktail parties saying "What's your sign?" rather than "Hi," then these things would be generally uncontroversial and hardly deserving of a defense, if only because they involve my personal values. An attack on scientific grounds, say, by quoting controlled studies, would be useless, because to me it would not address anything that matters. But quite the reverse applies if I claim that astrology is a source of knowledge and that the sky when you were born will indicate your destiny, because scientifically

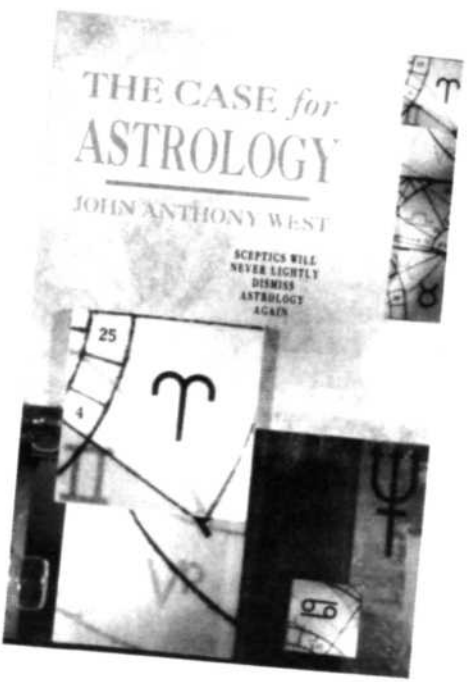
there seems to be no way it could work *to the required extent.* (Of course we cannot deny the possibility of a finite effect, just as we cannot deny the possibility that surfing in Hawaii affects the waves in Australia, but my claim here is for an effect that is *usefully large.*) Such a claim requires a rigorous defense.

To be sure, my values are not immune from criticism, any more than art is immune from literary and artistic criticism, but the criticism is of a different kind from that appropriate to astrology as knowledge—the first involves values, the second validity. It is one thing to prefer apples to oranges and quite another to say they fall upwards. In Parry's book these distinctions are not made. This did not stop a reviewer in the U.K. *Astrological Journal* (1991:208) from calling it "a real godsend."

The same defects apply to the second book, *The Case for Astrology,* by John Anthony West, which is a rewrite of the original 1970 edition coauthored with the late Jan Toonder. The original edition is historically important, because back in 1970, based on the then-emerging research, one could reasonably believe that some parts of astrology might have substance. In the new edition, West claims that the case has been strengthened, albeit with a new twist—this time he is arguing the case for *astrology,* not the case for *astrologers,* on the grounds that astrologers rarely perform better than chance, whereas the evidence for astrological effects (extraterrestrial influences, Gauquelin effects) is substantial. More on this later.

The first of six parts (128 pages) looks at the origins of astrology and is largely irrelevant. Part 2 (86 pages) replies to 12 popular objections and includes long rebuttals of Culver and Ianna's *Gemini Syndrome* and Bok and Jerome's *Objections to Astrology.* Here crooked thinking has a field day. For example, West (p. 160) takes Culver and Ianna's statement that science "is fair and objective, even if scientists are not" and says it "may well be among the silliest statements ever made by human beings. It is like saying justice is impartial, even though judges are corrupt" (p. 161). It is also like saying astrology works even if astrologers perform no better than chance, which is West's rationale for his entire book. So, by his own argument, his book could not be sillier. Why did he bother?

Similar shootings-in-the-foot follow. "When astrology is at issue, . . . or any other subject that challenges the spiritually flat inner world of the rationalist, the scientific method is drafted into service as a means of preserving dogma, not as a means for discovering truth" (p. 161). Apart from being wrong, this point is conveniently forgotten when the scientific method is later recruited in support of the Gauquelin results,



"No sensible person will opt for a paranormal explanation of tiny effect sizes. Tiny changes in experimental outcomes can be due to a huge number of ordinary causes."

these being "the single body of evidence that stands as scientific confirmation of astrology's most basic premise" (p. 313). Again, when scientists investigate astrology, the results are worthless because "only those data are carefully examined which enforce the preconceived position" (p. 161). No matter that this is precisely West's own approach. More on this later.

Of West's 12 popular objections to astrology, 7 are also in Parry's book, being the final 7 listed by me earlier. The other 5, with West's replies in parentheses and my occasional comment in italics, are as follows.

1. The sun is merely an incandescence, with no direct effect on our consciousness. (Maybe, but it is more scientific to assume that consciousness is universal and is thus possessed by the sun.)

This begs the question.

2. Fraternal and identical twins should be alike, but they are not. (This is a legitimate problem, but science itself is not without anomalies; also it applies only to the interpretation and becomes serious only if interpretation is a science, which it is not.)

This evades the issue.

3. Astrology cannot predict mass deaths. (But this does not deny that an individual astrologer can.)

Like who?

4. Births at high latitudes have distorted houses. (Houses are not essential.)

5. Tests of horoscope factors are negative. (This does not deny that better tests may be positive.)

Like what?

Speculation in lieu of evidence is not the only problem in this section. The text is frequently unbelievable, for example (p. 215), "Science cannot prove a difference between Spaniards and Swedes." (Try giving them a test in Swedish.) And having assured us that "there is no major objection to the astrological premise or practice that goes unanswered or unaddressed" (p. 11), West ignores the same crucial issues and distinctions that were ignored by Parry. The result is the same needless confusion that can only perpetuate the shouting match between astrologers and critics. Surely the case for astrology deserves better than this.

Part 3 (168 pages) looks at the evidence for astrology. Just over half is devoted to the Gauquelin work, including an account of the CSICOP involvement (with embarrassing examples of scientists refusing to recognize unwelcome results), of early work by Suitbert Ertel, and of the harmonic studies by the late John Addey. Unfortunately there are more antiscience polemics that are just so daft that one wonders how they got past Penguin's editors. For example, on page 271, scientists "are not interested in the truth at all. . . . They are interested in being right. Their egos are entirely bound up in their rightness and can brook no opposition. . . . Thus science is probably the only major profession in the twentieth century that is hypocritical at its core."

West then looks briefly at a handful of other positive studies, such as sun-sign guessing and matching tests (but not at the subsequent studies that negated their results), at extraterrestrial influences like sun spots and the Piccardi effect, and at physical expla-

nations, notably that of the astronomer Percy Seymour. Of interest here is a reprint of Nigel Henbest's critique from *New Scientist* (May 12, 1988) and Seymour's lengthy reply. Briefly, Seymour suggests that the planets exert a tidal force on the magnetosphere, which modulates geomagnetic activity, which induces currents in the neural network by resonance. Henbest points out that, due to planet retrogradation, the diurnal planetary frequencies overlap; so they cannot be distinguished by resonance. Seymour's answer is that the phases will differ; so once the fetus locks onto the right planet it will stay locked on. West fails to ask how it locks onto the right planet in the first place. There is also the problem that diurnal planetary frequencies (around 10^{-5} Hz) are some six octaves below the known lower limit for a reasonable biological response.

West concludes that the two basic astrological premises are established beyond doubt. These are: (1) *Celestial events correlate with terrestrial events,* which is uncontroversial but not so its implication: What has people's waking at sunrise to do with astrology? If astrology is reasonably defined as anything requiring a birth chart, the answer is nothing at all. (2) *Planetary positions at birth correlate with human personality.* This is based on the Gauquelin results, which West describes as "unsinkable" (p. 191). But such a conclusion is premature, because Ertel (1992) has shown at least some of them to be sinkable. It is also dead wrong for 99.995 percent of the population, namely, those who are not eminent. Moreover, other work cited by Ertel suggests that the correlation with personality (but not with occupation) is a methodological artifact. This also casts doubt on Addey's results, because he used the same database. So, contrary to West's claim the basic astrological premise is not even established, let alone beyond doubt.

"West's approach is like that of a Flat Earther who says 'Never mind the negative evidence for a flat earth, just look at the positive evidence.' Which of course is a recipe for disaster."

On the validity of astrological *practice,* West concludes that the evidence is uncertain but favorable on balance. And to make sure we agree he deliberately suppresses the negative evidence: "Since the aim of this book is to present the positive evidence, intimate details of the bulk of the negative evidence do not really concern us" (p. 234). Thus most of the recent tests cited by me in *SI* (Dean 1987) are not even mentioned. West argues that the negative evidence does not deny that positive evidence may yet be found, so "these negative results are effectively irrelevant to our case" (p. 353). But nowhere does he spell out the areas wherein such uncompromising verisimilitude might be found. Given that a recent meeting of U.K. research astrologers could think of no new areas to test, concluding that "if anything major was possible then it would have been suggested already" (Anon. 1992), West's argument is unconvincing.

West's approach is thus like that of a Flat Earther who says "Never mind the negative evidence for a flat earth, just look at the positive evidence." Which of course is a recipe for disaster. Reasonable judgments can be made only by considering *all* the evidence, not just the bits that happen

to support a particular case. Otherwise we are in danger of pulling tomato out of the pizza and declaring it to be tomato pie. When selection bias is removed, the evidence for the validity of astrological practice becomes distinctly unfavorable; see the review by Kelly et al. (1990). For the record, West was sent a copy of this review by Kelly, but no reference to it appears in the book.

Parts 4 through 6 (98 pages) are largely irrelevant, being a diatribe against skepticism, the press, and rationalism, with comments on counseling, interpretation, and free will. The book ends with a useful 10-page summary, an appendix listing the 186 scientists signing the 1975 statement against astrology, a bibliography of more than 120 books (but no articles), a subject index, and a name index.

Altogether this is a big book (527 pages) with big faults. Negative evidence is dismissed as irrelevant, crucial issues are ignored, and the text is frequently unbelievable. As shown by my quotations, West's style is one of sustained ridicule, as if violent language can somehow bludgeon a way through. When this polemic tone was criticized by the pro-astrology reviewer Derek Parker (1991), West (1991) replied: "My aim is not to convert skeptics . . . [but] to present that large, literate audience of closet believers with irrefutable evidence that says there's something to astrology after all, and to provide astrologers with ammunition to devastate their critics. To that end it is essential to discredit the opposition by exposing its 'objectivity' for the sham it is. I like to think my combination of scholarship and ridicule an appropriate tack." Not everyone will agree. To me at least, West's book exhibits all the faults he condemns in others. At which point I should warn that West identifies me as "a bitter opponent of astrology" (p. 349), so watch out for my sham objectivity.

In summary, both books perpetuate a needless confusion. To be sure, anything as popular as astrology deserves serious consideration. But anyone familiar with the results of controlled tests, and with the pitfalls of human judgment, must inevitably be suspicious of astrologers' claims. Unfortunately, astrologers have mistaken this sensible indifference for dogmatic hostility. In both books there was an opportunity to explore this confusion and set the record straight. But it was missed, and neither book contributes toward a balanced assessment of astrology—in fact, quite the reverse. If nothing else, you could always give copies to astrologers to set them up for later slaughter.

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Gordon Stein Named Director of Center for Inquiry Libraries

Gordon Stein, a longtime CSICOP Scientific Consultant, has been appointed director of the Center for Inquiry Libraries. He has also been named Visiting Fellow of the Institute for Inquiry, co-sponsored by CSICOP. Dr. Stein is on the faculty of the University of Rhode Island Library. He has a doctorate in physiology and a master's degree in library science.

CSICOP's Library of Skepticism, Science, and the Paranormal at the Center for Inquiry will be the largest and most complete collection of books and journals on the scientific evaluation of the paranormal. Scholarly works of any sort, as long as they are concerned with the paranormal or pseudoscience, will be included in the collection," Stein told *SI*. "The library will be open to researchers, scholars, journalists, and the general public. Online access to our catalogue of the contents of the library is planned, so that it can be searched by interested parties having a computer and modem." The Center for Inquiry Libraries will also include the Library of Freethought and Humanism."

Stein says that eventually the holdings of the Library of Skepticism, Science, and the Paranormal will be listed on the Online Computer Library Center (OCLC) database so that the collection may be made available through interlibrary loan nationwide.

"This specialized collection of books and journals relating to pseudoscience and the paranormal is one of the most valuable services CSICOP can provide," says Stein.

The library will be located at the CSICOP headquarters at the Center for Inquiry in Buffalo.

"While the library has the nucleus of a good collection, including, of course, all of the CSICOP and pertinent Prometheus publications," Stein says, "it now lacks many relevant books and journals. Donations of appropriate literature to the library, or cash grants to the Library of Skepticism, Science, and the Paranormal Endowment Fund, will be greatly appreciated."

All literature donations, grants, and inquiries should be sent to the Library of Skepticism, Science, and the Paranormal, 3965 Rensch Road, Amherst, NY 14226.

Diagnoses of Alien Kidnappings That Result From Conjunction Effects In Memory

ROBYN M. DAWES and MATTHEW MULFORD

Events and feelings may be better recalled when they occur in combination than singly, to the point that a conjunction of two alleged events or feelings may be judged to have occurred with greater frequency in one's life than one of them alone. One part of a conjunction can facilitate recall of the conjunction, and hence of another part of the experience—and combinations of events can be judged to be more probable than their components (Tversky and Kahneman 1983). The observer to whom it is reported, however, knows that such a conjunction is necessarily less probable than any one of its components. Thus, the observer may attach special significance to such a conjunction.

Because recalling one alleged event (e.g., waking up paralyzed) can enhance recall of another combined with it (e.g., thinking someone is in the bedroom), remembering such an objectively improbable combination is not diagnostic of anything (e.g., being kidnapped by aliens).

For example, in supporting a conclusion that post-traumatic stress from kidnapping by aliens is a major mental-health problem in this country (allegedly affecting at least 2 percent of the population), Hopkins and Jacobs (1992) cite the rate of affirmative responses to a recent Roper Poll question: "How often has this happened to you: Waking up paralyzed with a sense of a strange person or presence or something else in the room?" Their rationale for considering affirmative responses particularly diagnostic of alien kidnapping involves the conjunction of the two components in the question: "A fleeting sensation of paralysis is not unusual in either hypnogogic or hypnopompic states, but adding the phrase 'with a sense of a strange person or presence in the room' forcefully narrows the

Table 1: Response Frequencies

How often has this happened to you: Waking up paralyzed with a sense of a strange person or presence or something else in the room?[1]

Has not happened	Has happened once or twice	Has happened more than twice
(N)	*(N)*	*(N)*
87	36	21

How often has this happened to you: Waking up paralyzed?

Has not happened	Has happened once or twice	Has happened more than twice
(N)	*(N)*	*(N)*
124	12	8

[1] Exact wording from the Roper Poll.

scope of the question" (p. 56).

As part of a (much) larger study, we asked that same Roper Poll question of 144 subjects (mainly University of Oregon students and some townspeople interested in the $20 pay for two hours). Forty percent answered that this had happened to them at least once. A randomly selected control group of 144 subjects in the same study were asked simply how often they remembered waking up paralyzed. Only 14 percent answered that this had happened to them at least once, (chi-square = 24.26; $p < .001$, phi = .29). (See Table 1.) The contingency was stronger for women (phi = .44) than for men (phi = .17), significantly so according to a Goodman-Plackett chi-square value of 4.74. Nevertheless it was significant for both sexes (with chi-squares of 25.38 and 4.43, respectively).

Thus, due to a conjunction effect in memory, the added phrase "with a sense of a strange person or presence . . . in the room" actually "*broadens* the scope" of the question, rather than narrowing it. Hopkins and Jacobs are, of course, correct in maintaining that the additional phrase *should* "narrow the scope." It's just that the phrase doesn't. What they have discovered, therefore, is not evidence of alien kidnappings, but of a common irrationality in the way we recall our lives.

References

Hopkins, B., and D. M. Jacobs. 1992. "How This Survey Was Designed." In Bigelow Holding Company, *An Analysis of the Data from Three Major Surveys Conducted by the Roper Organization*, pp. 55-58.

Tversky, A., and D. Kahneman. 1983. Extensional versus intuitive reasoning: The conjunction fallacy in probability judgments. *Psychological Review*, 90: 293-315.

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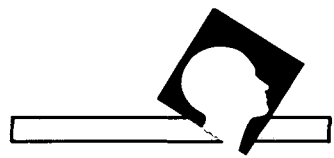
Mathematical Magic For Skeptics

ARTHUR BENJAMIN and
MICHAEL SHERMER

Skeptics and regular readers of the SKEPTICAL INQUIRER are always looking for ways to "wow" people with seemingly amazing feats of "psychic" power, only to then explain it was only magic and we must beware of those who are not so honest about their techniques. In this article, adapted from our book titled *Mathemagics: How to Look Like a Genius Without Really Trying*, we will demonstrate how to do just that with mathematical magic, "psychic" math tricks, and lightning-fast mental calculations, exactly the way I do them in my mathemagics act performed at the Magic Castle and elsewhere.* In essence, this is a crash course in how to look like a mathematical savant—a "Rainman," if you will—but it requires no special mathematical talents. There is nothing that I do that cannot be taught to someone else, even someone with no special aptitude for math beyond basic arithmetic. In short, it is my firmest belief that *anyone can learn this mathemagics program if they are willing to invest some effort and practice.—A.B.*



You too can "wow" people with mathematical magic, "psychic" math tricks, and lightning-fast mental calculations.

The Art of Rapid Mental Calculation

The first thing to learn about this program is that we will do the majority of the mental computations from left to right. This is a superior method because, for one thing, you do not have to reverse the numbers (as you do, for example, when adding from right to left). And if you want to estimate your answer, then computing only the leading digits will get you pretty close. If you are used to working from

*First-person refers to Arthur Benjamin, whose mental calculation program is outlined in this article.

Arthur Benjamin, "lightning calculator," performing at the Magic Castle. (Photo by Conard)

right to left on paper, it may seem unnatural to compute from left to right. But with practice you will find that it is the most natural and efficient way to do mental calculations.

2-by-1 Multiplication

Another advantage to mentally computing from left to right is that you can start to say your answer aloud before you have finished the calculation. That way you *seem* to be calculating even faster than you are. For example, let's begin with the simple 2-by-1 multiplication problem of 42×7. Treat 42 as $(40 + 2)$, then, computing from left to right, multiply $40 \times 7 = 280$. Next multiply $2 \times 7 = 14$. Add 14 to 280 left to right, $280 + 14 = 294$, the correct answer. We illustrate this procedure below.

The Amazing Benjamin

Arthur Benjamin, a mathematics professor from Harvey Mudd College in Claremont, California, takes the stage to a round of applause at the Magic Castle, a celebrated magic club in Hollywood, where he is about to perform *mathemagics*, or what he calls "the art of rapid mental calculation." Art appears nothing like a mathematics professor from a prestigious university. Astonishingly quick-witted, he looks at home with the rest of the young magicians playing at the Castle—which he is. Art has the unique distinction of being both an accomplished mathematician who has been published in scholarly journals and a "lightning calculator," a recognized mathemagician performing at professional venues.

This particular night at the Magic Castle, Art begins by asking if anyone in the audience has a calculator. A group of engineers raise their hands and join Art on stage. Having offered to test their calculators to make sure they work, Art asks a member of the audience to call out a 2-digit number. "Fifty-seven," shouts one. Art points to another, who calls out "23."

Directing his attention to those on stage, Art tells them: "Multiply 57 times 23 on the calculators, and if you don't get 1,311 the calculators aren't working correctly." Art waits patiently while the volunteers finish inputting the numbers. As each participant indicates his calculator reads 1,311, the audience lets out a collective gasp. The amazing Art has beaten the calculators at their own game!

Art next informs the audience that he will square four 2-digit numbers faster than his stage button-pushers can square them on their calculators. Art instructs four members of the audience to each call out a different 2-digit number, and then assigns his four calculator holders the task of squaring one number each. Looking at his stage helpers he declares: "I will try to race you to the answer."

The audience members call out the numbers "24, 38, 67, 97," and Art jots the answers down on the blackboard on the stage as quickly as they call them out. In large, bold letters for everyone to see, the sequence reads 576, 1444, 4489, 9409. Art turns to his aides who are just now finishing their calculations and asks them to call out their answers. Their response triggers the audience to gasp and then applaud: "576, 1444, 4489, 9409." The girl next to me sits with her mouth open in amazement.

Art now declares that he will attempt a 4-digit number. A woman calls out "1036" and Art instantly

$$
\begin{array}{rl}
 & 42\ (40+2) \\
 & \times\ 7 \\
\hline
40 \times 7 = & 280 \\
+\ 2 \times 7 = & +14 \\
\hline
 & 294
\end{array}
$$

Similarly, to multiply 48 × 4 your first step is to break down the problem into smaller multiplication tasks that you can perform mentally with ease. Since 48 = 40 + 8, multiply 40 × 4 = 160, then add 8 × 4 = 32. Adding left to right, the answer is 192.

Essentially, all 2-by-1 multiplication problems operate in this manner, by finding the easiest method of

responds, "That's 1,073,296." The audience laughs and Art explains, "No, no, that's much too easy a number. I'm not supposed to beat the calculators on these. Let's try another one." A man offers a challenging, 2,843. Pausing briefly between digits, Art responds: "Let's see, 2,843 gives you 8 million . . . 82 thousand . . . 649." He is right, of course, and the audience roars their approval as loudly as they did for the previous magician, who sawed a woman in half and made a dog disappear.

It is the same everywhere Art Benjamin goes, whether it is a high school auditorium, a college classroom, a faculty lounge, the Magic Castle, or a television studio. Benjamin has performed his special brand of magic live all over the country and on numerous television talkshows. He has been the subject of investigation by a cognitive psychologist at Carnegie-Mellon University and is the only living American featured in a scholarly book by Steven Smith called *The Great Mental Calculators: The Psychology, Methods, and Lives of Calculating Prodigies.* Art was born in Cleveland on March 19, 1961 (which he calculates was a Sunday). He began talking when he was six months old and reading when he was only two. A hyperactive child, Art drove his teachers mad with his classroom antics, which included correcting the mathematical mistakes they occasionally made.

I first encountered Art on a television special in which James Randi was offering a $100,000 reward for anyone who could prove psychic ability under the rigors of the scientific method. After none of the individuals claiming to have special powers was able to perform his or her particular skill under controlled conditions, Art Benjamin was brought on stage to demonstrate how apparently amazing and inexplicable feats of mind can often be performed by the simplest of tricks and with just a modicum of knowledge and practice. After astonishing the television audience (and presumably the home audience as well) with such feats as squaring 2-, 3-, and 4-digit numbers, and multiplying a 4-digit number by a different 4-digit number (all checked by a calculator in the corner of the television screen), the host explained that Art is not a psychic, nor does he claim secret power "from beyond." Rather, he is just an ordinary college math professor with a rather extraordinary skill at doing mental calculations that anyone can learn.

—*Michael Shermer*

simplifying the problem. You can see that all we have done is reduce the 2-by-1 problem into two 1-by-1 problems, followed by a relatively simple addition problem, all computed from left to right. For 3-by-1 problems the principle is the same.

3-by-1 Multiplication

Once you've mastered 2-by-1 multiplication, 3-by-1 multiplication is not much harder. For example, to multiply 326 × 7 you just reduce it to three 1-by-1 problems as illustrated below:

$$
\begin{array}{r}
326\ (300 + 20 + 6) \\
\times\ 7 \\
\hline
300 \times 7 = 2100 \\
20 \times 7 = +140 \\
\hline
2240 \\
6 \times 7 = +42 \\
\hline
2282
\end{array}
$$

Even when adding involves "carrying," the left-to-right process still goes smoothly:

$$
\begin{array}{r}
578\ (500 + 70 + 8) \\
\times\ 9 \\
\hline
500 \times 9 = 4500 \\
70 \times 9 = +630 \\
\hline
5130 \\
8 \times 9 = +72 \\
\hline
5202
\end{array}
$$

Be There or B^2: Squaring 2-Digit Numbers

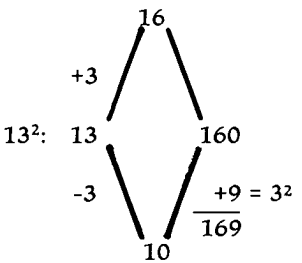
Squaring numbers in your head is one of the easiest yet most impressive feats of mental calculation you can do. I can still recall where I was when I discovered how to do it. I was 14, sitting on a bus on the way to visit my father at work in downtown Cleveland. It was a trip I had made often, so my mind began to wander. I began thinking about the numbers that add up to 20. How large could the product of two such numbers get?

I started in the middle with 10 × 10 (or 10^2), the product of which is 100. Next I multiplied 9 × 11 = 99, 8 × 12 = 96, 7 × 13 = 91, 6 × 14 = 84, 5 × 15 = 75, 4 × 14 = 56, and so on. I noticed that the products were getting smaller, and their difference from 100 was 1, 4, 9, 16, 25, 36—or 1^2, 2^2, 3^2, 4^2, 5^2, 6^2, and so on.

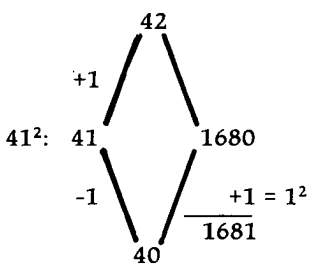
I found this pattern astonishing. Next I tried numbers that add to 26 and got similar results. First I worked out $13^2 = 169$, then computed 12 × 14 = 168, 11 × 15 = 165, 10 × 16 = 160, 9 × 17 = 153, and so on. Just as before, the distance these products were from 169 was 1^2, 2^2, 3^2, 4^2. . . .

Then I realized this pattern could help me square numbers more easily. Suppose I wanted to square the number 13, I said to myself. Instead of multiplying 13 × 13, why not get an approximate answer by using two numbers that are easier to multiply but also add up to 26? I chose 10 × 16 = 160. To get an exact answer, I just added 3^2 (since 10 and 16 are each 3 away from 13). Since $3^2 = 9$, $13^2 = 160 + 9 = 169$.

This method, the one I use for all squares, is diagrammed as follows:



Now let's see how this works for another square:



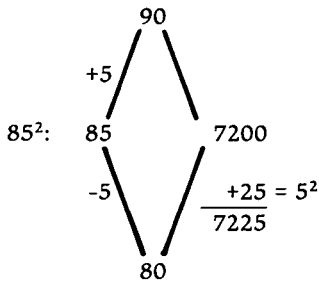
To square 41, subtract 1 to obtain 40 and add 1 to obtain 42. Next multiply 40 × 42. Don't panic! This is simply a 2-by-1 multiplication problem (specifically, 4 × 42) in disguise. Since 4 × 42 = 168, 40 × 42 = 1680. Almost done! All you have to add is the square of 1 (the number by which you went up and down from 41), giving you 1680 + 1 = 1681.

The method is based on the simple

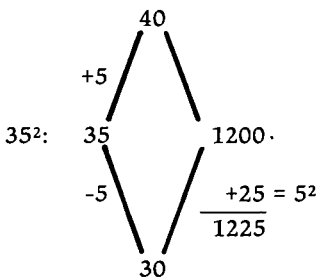
relation $A^2 = (A + d)(A - d) + d^2$, although my algebra was not strong enough at the time to prove it.

If the 2-digit number ends in 5, both the multiplication and addition are trivial.

For example:



Or:



2-by-2 Multiplication

In squaring 2-digit numbers the method is always the same. In multiplying two different 2-digit numbers, however, you can use lots of different methods to arrive at the same answer. For me, this is where the *fun* begins. The first method you will learn is the *addition method*, which can be used to solve all 2-by-2 multiplication problems.

The Addition Method. To use the addition method to multiply any two 2-digit numbers, all you need to do is perform two 2-by-1 multiplication problems and add the results together.

For example:

$$\begin{array}{r} 46 \\ \times\ 42 \quad (40 + 2) \\ \hline 40 \times 46 = 1840 \\ 2 \times 46 = +92 \\ \hline 1932 \end{array}$$

Here you break up 42 into 40 and 2, two numbers that are easy to multiply by. Then you multiply 40 × 46, which is just 4 × 46 with a 0 tacked on the end, or 1840. Then you multiply 2 × 46 = 92. Finally, you add 1840 + 92 = 1932, as diagrammed above.

Here's another way to do the same problem:

$$\begin{array}{r} 46 \quad (40 + 6) \\ \times\ 42 \\ \hline 40 \times 42 = 1680 \\ 6 \times 42 = +252 \\ \hline 1932 \end{array}$$

The catch here is that multiplying 42 × 6 is harder than multiplying 46 × 2, as in the first problem. Moreover, adding 1680 + 252 is more difficult than adding 1840 + 92. So how do you decide which number to break up? I try to choose the number that will produce the easiest *addition* problem. In most cases—but not all—you will want to break up the number with the smallest last digit because it usually produces a smaller second number for you to add.

The Subtraction Method. The subtraction method really comes in handy when one of the numbers ends in 8 or 9. The following problem illustrates what I mean:

$$\begin{array}{r} 59 \quad (60 - 1) \\ \times\ 17 \\ \hline 60 \times 17 = 1020 \\ -1 \times 17 = -17 \\ \hline 1003 \end{array}$$

The Factoring Method. The factoring method, my favorite way to multiply

2-digit numbers, involves no addition or subtraction at all. You use it when one of the numbers in a 2-digit multiplication problem can be factored into 1-digit numbers.

To see how factoring makes multiplication easier, consider the following problem, repeated from the section on the addition method above: 46 × 42. Previously we solved this problem by multiplying 46 × 40 and 46 × 2 and adding the products together. To use the factoring method, treat 42 as 7 × 6 and begin by multiplying 46 × 7, which is 322. Then multiply 322 × 6, which is 1932, for the final answer. You already know how to do 2-by-1 and 3-by-1 multiplication problems, so this should be easy:

$$46 \times 42 = 46 \times (7 \times 6) = (46 \times 7) \times 6 = 322 \times 6 = 1932$$

Of course this problem could also have been solved by reversing the factors:

$$46 \times 42 = 46 \times (6 \times 7) = (46 \times 6) \times 7 = 276 \times 7 = 1932$$

But, as you can see, it is easier to multiply 322 × 6 than it is to multiply 276 × 7. In most cases I like to use the larger factor in solving the initial 2-by-1 problem and to reserve the smaller factor for the 3-by-1 component of the problem.

Factoring allows you to do what you need to do: simplify from larger to smaller numbers, and from harder to easier problems. The advantage of the factoring method in mental calculation is that you do not have to hold much in memory. Let's look at another problem by way of example:

$$75 \times 63 = 75 \times 9 \times 7 = 675 \times 7 = 4725$$

As before, you simplify this 2-by-2 problem by factoring 63 into 9 × 7 and then multiplying 75 times these factors.

No doubt you may think of other variations on how to solve these and other problems. Space limitations prevent us from demonstrating the numerous variations of mental problem-solving that we are able to elaborate on in greater detail in our book. We also show you how to multiply and square any numbers up through 5-by-5 multiplication, as well as rapid left-to-right techniques for mental division, addition, and subtraction. We even include a paper-and-pencil method of doing any 10-by-10 multiplication problem, where you can write the entire answer down on one line with no intermediate steps!

We shall end this article with a few mathematical magic tricks that are simple and fun to do.

How to Look Like a Genius Without Really Trying

Here we present some mathematical magic tricks that do not require any calculating skill.

1. Think of a 3-digit number in which the first digit is larger than the last digit.

2. Reverse that number and subtract it from the first number. If the result is a 2-digit number, tell them to put a 0 in front of it.

3. Take that answer and add it to the reverse of itself.

At the end of this sequence the answer 1089 will magically appear, no matter what number you originally chose. For example:

851	685
-158	-586
693	099
+396	+990
1089	1089

Oxymorons and 'Idiot Savants'

Among the more popular terms of popular culture of late is *oxymoron*, or a combination of contradictory words, applied humorously ("jumbo shrimp"), sarcastically ("military intelligence") and sometimes curiously, as in in the strange case of *idiot savants*. This term, most commonly used throughout the twentieth century to describe mentally handicapped individuals with a gift for a particular skill, comes from the time when "idiot" was an actual designation on an I.Q. test (quite low). "Savant" is French for "wise." the term literally translates as the "wise idiot," and thus is an oxymoron.

Many idiot savants have a remarkable talent for lightning calculations, art, music, and memory, among other things. There is the case for example, of the Minnesota woman with an I.Q. of a two-year-old who could play brilliant piano without reading a single note of music. Or those who can memorize telephone directories, railway timetables, sports scores, and biographical information. There is the mentally retarded man who memorized the population figures for every town in America, the number of rooms at more than two thousand hotels, and information on more than three thousand mountains and two thousand inventions. Among the most common skills is calendar calculating, where the idiot savant can give past and future days and dates in almost any combination of challenges, such as the years on which September 14 falls on a Wednesday.

How are these individuals able to perform such mental feats? It is clear that many calculating skills, such as those described in the accompanying article—can be performed by anyone. But there are plenty that cannot be duplicated. One theory is that the retardation of most other skills makes available more brain power to concentrate on a single problem that can be focused on intensely and for great lengths of time. Since "normal" stimulation is lacking, the idiot savant makes up for it by intense concentration on specific problems.

—*A.B. and M.S.*

Why This Trick Works. No matter what 3-digit number you or anyone else chooses in this game, the final result will always be 1089. Why? Let *abc* denote the unknown 3-digit number. Algebraically, this is equal to:

$$100a + 10b + c$$

When you reverse the number and subtract it from the original number you get the number *cba*, algebraically equal to: $100c + 10b + a$

Upon subtracting *abc* - *cba*, you get:

$$\begin{array}{r} 100a + 10b + c \\ -(100c + 10b + a) \\ \hline 100(a-c) + (c-a) = 99\,(a-c) \end{array}$$

Hence after subtracting in step 2, we must have one of the following multiples of 99: 099, 198, 297, 396, 495, 594, 693, 792, or 891, all of which produce 1089 after adding it to the reverse of itself in step 3.

Missing Digit Tricks

Using the number 1089 from the last effect, hand a volunteer a calculator and ask her to multiply 1089 by any 3-digit number she likes, but not to tell you the 3-digit number. (Say she secretly multiplies 1089 × 256, which is 278, 784.) Ask her how many digits are in her answer. She'll reply 6.

Next you say: "Call out 5 of your 6 digits to me in any order you like. I shall try to determine the missing digit."

Suppose she calls out "2 . . . 4 . . . 7 . . . 8 . . . 8." You correctly tell her that she left out the number 7.

The secret is based on the fact that the digits of any multiple of 9 must add up to a multiple of 9. Since 1089 is a multiple of 9, so will be 1089 times any whole number. Since the digits called out add to 29, and the multiple of 9 is 36, our volunteer must have left out a 7.

There are more subtle ways to force the volunteer to end up with a multiple of 9. Here are some of my favorites.

1. Have the volunteer randomly choose a 6-digit number, scramble its digits, then subtract the smaller 6-digit number from the larger one. Since we're subtracting two numbers whose digits add up to the same number, the difference will be a multiple of 9.

2. Have the volunteer secretly choose a 4-digit number, reverse the digits, then subtract the larger number from the smaller. (The difference will be a multiple of 9.) Then multiply this by any 3-digit number. The product will be a multiple of 9.

3. Ask the volunteer to randomly multiply 1-digit numbers until the product is seven digits long. This is not "guaranteed" to produce a multiple of 9, but in practice it will be so at least 90 percent of the time (if the 1-digit numbers included a 9 or two 3s or two 6s, or a 3 and a 6). I often use this method in front of mathematically advanced audiences who might see through the other methods.

There is one problem to watch out for. Suppose the numbers called out added to a multiple of 9 (say 36). Then you have no way to determine if the missing digit is 0 or 9. How do you remedy that? Simple, you cheat! You merely say: "You didn't leave out a 0, did you?" If he did leave out a 0, you have completed the trick successfully. If he did not leave out the 0, you say: "Oh, it seemed like you were thinking of nothing! Nor did you leave out a 1, 2, 3, or 4, did you?" He'll nod or say "yes." Then you follow with: "Nor did you leave out a 5, 6, 7, or 8 either. You left out the number 9, didn't you?" He'll respond in the affirmative and you will receive your due applause.

Quick Cube Roots

Ask someone to secretly select a 2-digit number, then have that person cube the number, i.e., multiply it by itself twice (using a calculator). For instance, if the original number was 68 the calculator would display 68 × 68 × 68 = 314,432. Then ask the person to tell you the answer. Once he or she tells you the cube, you can instantly reveal the original number (the cube root), of 68! How? To calculate cube roots, you need to learn the cubes from 1 to 10:

$1^3 = 1$	$6^3 = 216$
$2^3 = 8$	$7^3 = 343$
$3^3 = 27$	$8^3 = 512$
$4^3 = 64$	$9^3 = 729$
$5^3 = 125$	$10^3 = 1000$

Once you have learned these, calculating cube roots is as easy as π. For

Learned Men and Great Fools: Thomas Fuller

We are strangely compelled by stories of ordinary men doing feats so far beyond expectation that they invoke awe and wonder. Such is the case of Thomas Fuller (1710-1790), a black man who not only was illiterate but was forced to work in the fields of Virginia as a slave and never received a single day of education. The "property" of Elizabeth Cox, Thomas Fuller taught himself to count to 100 after which he increased his numerical powers by counting such items at hand as the grains in a bushel of wheat, seeds in a bushel of flax, and the number of hairs in a cow's tail (2,872).

Extrapolating from mere counting, Fuller learned to compute the number of shingles a house would need to cover its roof, the number of posts and rails to enclose it, and other construction problems. His prodigious skills grew, and with them his reputation, to such an extent that in old age he was challenged by two Pennsylvanians to mentally compute the solutions to a number of problems that would challenge the best lightning calculators. For example, they asked: "Suppose a farmer has six sows, and each sow has six female pigs the first year, and they all continue to increase at the same rate. At the end of eight years, how many sows will the farmer have?" The problem can be written as $7^8 \times 6$, that is, $(7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7) \times 6$. Within ten minutes Fuller gave his response of 34,588,806, the correct answer.

The *Columbian Centinel*, upon Fuller's death in 1790, reported that "he could give the number of poles, yards, feet, inches and barley-corns in any given distance, say the diameter of the earth's orbit; and in every calculation he would produce the true answer, in less time than 99 men in 100 would take with their pens." When Fuller was asked if he regretted having never gained a traditional education, he responded: "No, Massa. It is best I got no learning: for many learned men be great fools."

—*A.B. and M.S.*

example: What's the cube root of 314,432?

Seems like a pretty tough one to begin with, but don't panic. It's actually quite simple. As usual, we'll take it one step at a time:

1. Look at the magnitude of the thousands number (the numbers to the left of the comma), or 314 in this example.

2. Since 314 lies between $6^3 = 216$ and $7^3 = 343$, according to our list of cubes, the cube root lies in the 60s. Hence the first digit of the cube is 6.

3. To determine the last digit of the cube root note that only the number 8 has a cube that ends in 2 ($8^3 = 512$), so the last digit must be 8.

Therefore, the cube root of 314,432 is 68. Three simple steps and you're there. (Notice that every digit 0, 1, ... 9 appears once among the last digits of cubes. In fact, the last digit of the cube root is equal to the last digit of the cube of the last digit of the cube! Go figure that one out!) Now you try

one for practice: What's the cube root of 19,683?

1. 19 lies between 8 and 27 (2^3 and 3^3).

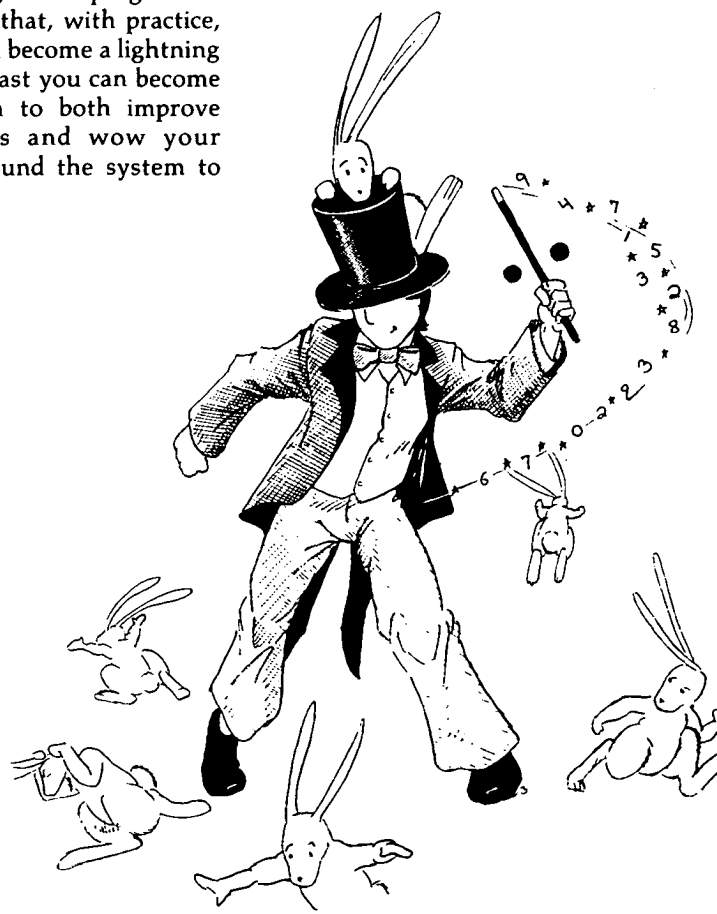
2. Therefore the cube root is 20-something.

3. The last digit of the problem is 3, which corresponds to $343 = 7^3$, so 7 is the last digit. The answer is 27.

Notice that our derivation of the last digit absolutely depends on the original number being the cube of a whole number. For instance, the cube root of 19,684 is 27.0004572 . . . , definitely not 24.

I know this all probably seems like a lot to learn and that it can only be done by math whizzes. I can assure you that I've taught this program to many people and that, with practice, almost anyone can become a lightning calculator, or at least you can become proficient enough to both improve your math skills and wow your friends. I have found the system to be a great way to promote skepticism and rational thinking, because it demonstrates just how powerful the mind can be in its normal functioning. It only requires a few basic skills and practice. Good luck!

Arthur Benjamin teaches mathematics at Harvey Mudd College in Claremont, California, and regularly performs his mathemagics show for audiences across America. Michael Shermer is an adjunct assistant professor of the history of science at Occidental College in Pasadena, California.



The Blind Girl Who Saw the Flash of the First Nuclear Weapon Test

ROLF SINCLAIR

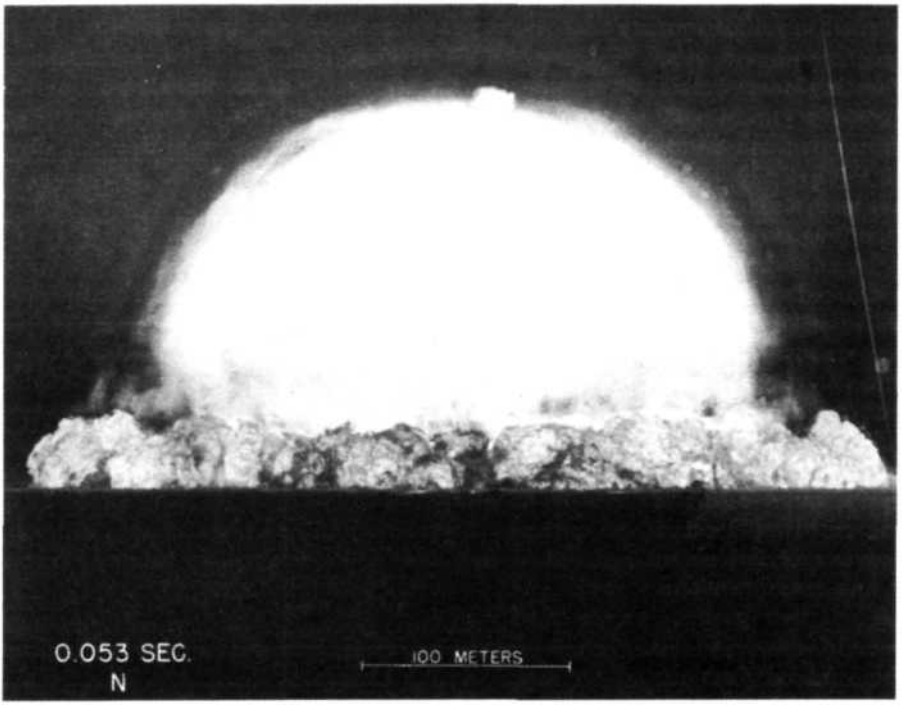
There is a well-known story about a blind girl sitting by a window in Albuquerque, New Mexico, who suddenly said, "What was that flash of light?" The time was shortly before dawn on July 16, 1945—the event she was supposed to have seen was the first explosion of a nuclear bomb, 120 miles to the south.

I first heard the story in 1947 or 1948 in Atlanta. It seemed at that time to be well established in the current conventional wisdom, even if it made no sense scientifically. I heard it again occasionally over the decades, and then it was told to me—unchanged—in 1989 in Albuquerque. At that time I had just finished reading *The Woman at Otowi Crossing* (Waters 1987), a novel in which this story figured anecdotally in a cameo appearance, and I decided to pursue it to its source.

There is less than meets the eye in this oft-repeated story.

The truth was surprisingly easy to find. I had only to check newspaper files and make a few phone calls. I found a stranger story than the one I had been hearing, but one that had been pushed aside in favor of a neat, well-defined myth that mixed fact with an appealing element of fantasy.

The United States had been pursuing the highly secret development of a nuclear weapon since 1940—at first slowly, and then after 1942 at an ever-accelerated pace as the Manhattan Project, under the direction of General Leslie R. Groves. The scale of the work was matched only by General Groves's insistence on total secrecy concerning an enterprise that was using a measurable fraction of the industrial capacity of this country. It was remarkable how effective



Day of Trinity: The first atomic explosion (here at 0.053 seconds after time zero) lights up the predawn skies of south-central New Mexico on July 16, 1945. But was the light really so unusual it could be seen by a blind girl? (Photo courtesy of National Atomic Museum, U.S. Department of Energy.)

he was in keeping the very existence of the project a secret. But even though the plans for testing the first nuclear bomb in a desolate corner of New Mexico were kept from the public, the fact of the test itself was immediately obvious. The explosion gave off more light than anyone expected (Groves 1983: 438). This brilliant flash, which was visible up to 200 miles away, could not be hidden.

Georgia Green was born and raised in Socorro, a small town 75 miles south of Albuquerque. She had vision in only one eye as a young child. Then, at age seven, she damaged that eye when she hit it on an open refrigerator door and essentially lost its use. She was a talented and resourceful person who bravely shaped her life in spite of this handicap. She studied music at the local college in Socorro for two years and then moved to Albuquerque and attended the University of New Mexico.

She had come home to Socorro during a summer vacation in 1945, and then, before dawn on July 16, was being driven back to her classes in Albuquerque by her family. At 5:29:45 A.M. Mountain War Time, when their car had reached Lemitar, about six miles north of Socorro, the sky to the east suddenly lit up "like daylight." The world's first nuclear device had just been detonated at the Trinity Site about 50 miles away. They stopped the car and watched this strange light flare up and then fade away.

Anticipating that the test would

draw some attention, General Groves had prepared a series of mock news releases describing various levels of a purported accidental explosion in a munitions dump at the Alamogordo Air Base (the nearest military camp to the Trinity Site). Although press censorship could not stop some word getting into the local papers, it was possible to channel the stories in such a manner that news of the unusual event did not achieve wide distribution (Groves 1983: 435). The *Albuquerque Journal* on Tuesday, July 17, ran such a story: "Explosives Blast Jolts Wide Area." It quoted several eyewitnesses from various parts of New Mexico and included a brief reference to Georgia Green:

> So brilliant was the flash from the explosion that Miss Georgia Green of Socorro, blind University of New Mexico student, said "What's that?"

A longer version of this account (which presumably had the same origin as the quote in the *Journal*) appeared in the weekly *Socorro Chieftain* on Thursday, July 19:

> An explosives magazine at the Alamogordo air base blew up Monday morning, and the flash, sound and shock were seen, heard and felt in Socorro, more than 100 miles away. . . . The flash was intensely white and seemed to fill the entire world. It was followed by a large crimson glow. The flash lasted only a second or so. It was so bright that Miss Georgia Green of Socorro, blind student at the University of New Mexico, being driven to Albuquerque by her brother-in-law, Lieutenant Joe Wills, asked, "What's that?"

This reads like a shortened version of an interview with someone in the car with Georgia Green that morning—as though that person spoke to a reporter after arriving in Albuquerque, or after returning later that day to Socorro. Either way, the Associated Press picked up that story and those of other observers, reduced each to a sentence or two, and made a composite story available to major newspapers.

Once a nuclear bomb had been used against Japan on August 6, the Army released long accounts of the new weapon, its development, and its first trial in New Mexico in July. These details were featured in the newspapers. The account of the "blind girl" was picked up again and repeated. And so the story grew. One paper ran a banner headline: "Blind Girl Saw Test Explosion 120 Miles Away." (This is from a newspaper clipping on display in the Los Alamos Historical Society Museum: Associated Press story, no date, no newspaper name.) Georgia Green became simply the "blind girl," and her location at the time of the explosion was shifted from near Socorro to Albuquerque itself.

In October 1989 in Socorro I visited Georgia's sister Elizabeth and Elizabeth's husband, who had been in the car with Georgia that morning, and I learned many of these details. They told me how Georgia had gone on to study and then teach at the University of New Mexico, how she had been the organist at the Methodist church in Socorro, how she learned to sew, and how she had been babysitter to her nieces and nephews. Georgia often told the story of how she had "seen" the first nuclear test. She lived a long, productive life and died a few years before my visit. Elizabeth and her husband agreed that Georgia was "blind," in that she had no useful vision. But apparently she could distinguish light and dark. Elizabeth made the telling statement that on that morning in 1945, when the flash of light appeared suddenly in the east,

they stopped the car and helped Georgia out "to let her look at the flash."

I could only conclude that Georgia could detect a strong light in a limited way, and that this was known to her family.

General Groves had the eye for detail that was essential in many ways to his supervision of the weapon project. He personally orchestrated the press response to the Trinity test so as to minimize the inferences that could be drawn from the published reports. He noted the various accounts of eyewitnesses that were surfacing and wrote, "One of these was a blind woman who saw the light" (Groves 1983: 435).

The official history of the Manhattan Project quoted the same newspaper accounts: "A significant aspect, recorded by the press, was the experience of a blind girl near Albuquerque many miles from the scene, who, when the flash of the test lighted the sky before the explosion could be heard, exclaimed, 'What was that?' " (Smyth 1945: 250-251).

One writer, Lansing Lamont, did verify the story and interviewed the occupants of the car. He wrote: "Georgia Green felt the flash and a sudden loss of breath. 'What's that?' she gasped and clutched the arm of her brother-in-law. The car shook and swerved off onto the shoulder of the road" (Lamont 1985: 235). So even if Georgia herself did not see the flash, perhaps she sensed its heat; at any rate the driver saw it and swerved, and Georgia made the now-famous remark. Another account of the test supplied stories of a number of unintended eyewitnesses to the explosion, and (quoting the *Albuquerque Journal*) said that a blind woman had somehow noticed the blast (Szasz 1984: 85).

There was now a firm basis for the story of Georgia Green seeing the flash of light. Then it became an element in fictional accounts. In one novel we find, "At this instant a blind girl seated at her window in Albuquerque, 120 miles away, spoke quickly to a companion. 'What is that bright flash in the sky?' " (Waters 1987). In another novel we have, "Old Grandma told him . . . 'as I walked back from the kitchen to my bed there was a flash of light through the window. So big, so bright even my old clouded-up eyes could see it. It must have filled the whole south-east sky. I thought I was seeing the sun rise again. . . .' " (Silko 1977: 245).

And so the story persists. Light is light, even that from a nuclear test, but the legend has it that there is a special quality to the light from a nuclear bomb so that it can be "seen" by a blind person.

This story qualifies as a "new urban legend" (Brunvand 1986). People who pass it on "know" it to be true. It made some kind of sense in 1945 when it started: that the light from such a new and terrible weapon, so far removed from normal experience, would be so unusual that it could be sensed by someone blind to ordinary light. And the story appeared (with few or no direct references) in the many newspaper accounts of the explosion. Few people seemed to have checked on the origin of the story; most were content to simply repeat it. From there the story grew until it settled into its present stable form and became a standard literary device.

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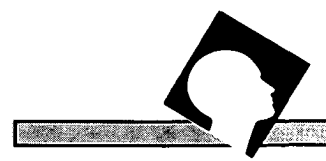
Science: The Feminists' Scapegoat?

BARBARA G. WALKER

We in the feminist movement have become justly critical of the exploitation and waste of natural resources that characterize our technological civilization. We want the earth treated with more respect. We want nature to be recognized as a sacred, living power instead of a soulless object of conquest. We want less of the arrogance of Big Science and Big Business, and more of the fittingly humble appreciation of the gifts of life. We are sick of a traditional philosophical dualism that divides lordly male intellectual "mind" from ignoble female emotional "matter." We want to replace that dualism with a new idea of wholeness.

This is all very well and laudable from a philosophical viewpoint. But we must observe certain caveats. We [feminists] are in danger of going too far into our own brand of dualism, when we label patriarchal and bad everything that is modern/scientific, while declaring matriarchal (or natural) and good everything that is primitive/magical. At the same time, we accept with off-handed ingratitude the gifts of technology that are made available to us every day: electric light, radio, television, telephones, trains, airplanes, cars, computers, central heating, hot water, dishwashers, stoves, grocery stores, and the multitude of consumer goods that we consider essential—plus the real miracles of modern medicine and the vastly increased knowledge of Nature that only the scientific method has been able to provide.

Personally, I am willing to grant a due portion of respect and appreciation to the scientific method. Like our ancestors, I am intensely curious about the nature of nature; but unlike them, I do not have to depend so heavily on



New Age notions infiltrating the feminist movement create unwarranted barriers between women and science.

my own crude guesses. Thanks to modern science, I can know how many light-years distant a certain star is; why springtime sap rises to the top of the tree; what elements form the composition of my favorite crystal; what the function of my pancreas is; and how animals and plants exchange atmospheric gases. No such things could have been discovered without the scientific method. Guessing, imagining, or meditation-revelation never managed to resolve any such questions in a trustworthy manner.

Medicine, especially, has come a long way since primitive healers were treating wounds with mud packs and sympathy, or beating drums to cast out the "evil spirit" of appendicitis. Were it not for techniques developed only in the present century, both my son and I would have died years ago, and my husband would have lost his leg, and perhaps also his life. Magic certainly would not have saved us.

Only science, with its objective, "linear" approach, could have discovered bacteria, viruses, antibiotics, chromosomes, genes, molecules, atoms, elements, hormones, leucocytes, microorganisms, chlorophyll, ozone, the human ovum, or details of the solar system—not to mention the mind-boggling extent of our galaxy, let alone the existence of other galaxies and the vastness and age of the universe. Almost everything that we can claim to know with any certainty about our world has been learned through science and not by subjectivity, instinct, or insight. In fact, the primary characteristic of human subjectivity is not certainty at all, but diversity.

Of course the subjective has its place. It is an essence of the deepest self, the inner working of archetypal patterns. Without it, we are dead at

"We [feminists] are in danger of going too far into our own brand of dualism, when we label patriarchal and bad everything that is modern/scientific, while declaring matriarchal (or natural) and good everything that is primitive/magical."

heart, without creativity, without spirit, without hope. But we must avoid the trap that lurks within the attractive holistic idea: the trap of allowing subjectivity to substitute for hard knowledge, the kind of knowledge that can be consistently verified by all investigators. We need hard knowledge. And I suspect that too many people reject it for no better reason than that it is hard to learn, requiring more time, concentration, mental focus, and reasoning ability than they are able or inclined to exert.

It is quite possible to live a successful life without scientific literacy. Still, those who cannot comprehend science are effectively locked out of the intellectual seats of power in a technological age. For centuries, women have been locked out of various seats of power partly on the ground of their alleged nonrationality. It has been claimed that women lack logic, objectivity, and reasoning ability and that therefore they cannot learn scientific procedures and must be restricted to the realms of emotion and the functions of service. This has been a major prop for the myth of female intellectual inferiority.

Some feminists fall back into the same old myth by drawing new distinctions between linear and holistic thought, labeling the former "masculine" and the latter "feminine" (or "left-brain" and "right-brain"). They claim a separate-but-equal status for the "feminine" mode, but this is not materially different from the more tolerant varieties of traditional sexism. For women to imply that women generally cannot, need not, or should not be scientifically aware is to put down their very real reasoning powers and to cause difficulties for those women who do pursue scientific careers, and who must contend with the same residual negative attitudes from their male colleagues every day. Women, especially those trained in scientific methods, are perfectly capable of objective reasoning. Many do it brilliantly and deserve more credit for analytical keenness than some male associates are usually prepared to give them.

Furthermore, it is important for women to analyze and criticize all the patriarchal myths with the clear-eyed objectivity that can uncover their untenable premises and secret motives. This is best done in a logical manner, without recourse to unfounded hypotheses, baseless claims, or lunatic fringeism. The feminist cause is not helped by those who, lacking scientific knowledge, may make foolish or false statements about matters of fact. It is all too easy to prove them wrong, and thus cast doubt on their whole theme. Women are not well served by scientific naiveté.

It would be a pity to reject any branch of learning for no better reason than that it is too complicated or difficult. It would be a tragedy to plunge the civilized world into a new Dark Age of Ignorance for no better cause than our own laziness. We all have the unfortunate inclination to think our own mental processes somehow right and superior to the

mental processes of others; but people must beware of the tendency to put down the scientific attitude just because their own minds don't happen to work that way. The scientific attitude is the best tool that humanity has managed to develop, so far, for finding out what nature really is and what it is not.

To reject such a tool would be like deliberately blinding our newly opened eyes. When science is just beginning to show us the astonishing diversity, complexity, and richness of the world, of which our species is a tiny component, should people deny that mighty vision simply because they find scientific study too demanding for their taste?

Certainly, scientific investigations of nature arose within a system dominated by men and with underlying patriarchal attitudes. Nevertheless, it must be remembered that the whole point of the scientific method is to exclude the personal attitudes of the investigator, no matter what they are, and to concentrate on the subject matter alone. In fact, patriarchal religion often has been bitterly opposed to the progress of science, whose objective investigations have continually revealed the untenability of traditional Bible-based concepts about the world. Ever since the Church forced Galileo to renounce his proofs of the earth's orbit around the sun, some theological authorities have been resisting scientific knowledge that might interfere with their worldview. Were it not for scientific studies of both nature and human culture, we might be still struggling in the iron grip of a rigidly sexist theocracy, compelled to accept fables as God-given truths. For this, too, we should be grateful.

Throughout the long ages, human beings have been asking themselves millions of questions for which they have no answers. How high is the sky, and why does it look blue? What is air and why do we need to breathe it? Why does the sun give off heat? Why do the seasons change? What makes a seed sprout? What makes a heart beat? Why does wood burn, while stone does not? What causes lightning, thunder, earthquakes, wind, ocean tides? How is it that water falls from the sky, while smoke rises up to it? Why is our blood red? How can a woman's body grow a baby? And so on, through all the questions you could think of if you thought nothing else, day and night, for a blue moon's time.

"For women to imply that women generally cannot, need not, or should not be scientifically aware is to put down their very real reasoning powers and to cause difficulties for those women who do pursue scientific careers."

It's all too easy to produce imaginative answers to such questions. Yet the truly inquisitive mind is not satisfied with imagined or metaphorical answers. The truly inquisitive mind wants to *know*. Imagination is fine for art, music, drama, dance, poetry, and fiction. But how intelligent would we be if we persisted in believing literally, as our forebears believed, that the earth is flat, that the sunset reflects the fires of the underworld, or that a spirit of disease can be frightened out of the body by a scary mask?

Literal information should not depend on fantasy. The valid premise of science is that, once information has been established and verified accord-

ing to logical experimentation, that piece of information can be trusted.

Women must continue to secure access to the best scientific knowledge of their time, for themselves and their children, because knowledge represents their freedom as well as their power to deny stereotypes. People do not have to be scientists themselves in order to be scientifically literate. They have only to tear themselves away from the entertainment industry long enough to read, study, take notes, and interest themselves in literature that truthfully describes the natural world.

What many feminists rightly mistrust is not scientific information per se, but the moral and ethical turpitude of those who misapply such information in destructive ways. We fear the misuse of technology, which can result in an exhausted Earth, with poisoned soil, air, and water. We denounce the destruction of whole populations of plants and animals through the technology that renders their natural defenses useless. We are horrified by Earth's growing burden of man-made toxic substances. We fear for the lives of our descendants in an increasingly inhospitable environment. Most of all, we are terrified by a vision of nuclear doomsday that could leave our once-fertile Earth as sterile as Mars. But if we spread a whole blanket of blame over everything "scientific" because of these justifiable fears, surely we are obscuring our proper target. It isn't scientific knowledge that is our enemy; it is the *application* of scientific knowledge in the bottom-line sort of morality that permits anything as long as it can make money.

Let us not make a scapegoat of the best means of comprehending nature that humanity has been able to devise after three million years of trying. To do so is to allow ourselves to be diverted from the real issue, which is the development of a new feminist morality that can make better use of both nature's gifts and human understanding. Indiscriminate trashing of all scientific disciplines will take us nowhere but backward. We need better assimilation and use of what has been learned, not renunciation of learning.

Barbara G. Walker is the author of 19 books, including The Skeptical Feminist, The Woman's Encyclopedia of Myths and Secrets, *and* Amazon.

The Importance of Doubt

The importance of doubt as the first step to knowledge was one of the principles our father taught us both. It was due to his love and appreciation of nature that we both became scientists.

—Joan Feynman (sister of the late Richard Feynman), Jet Propulsion Laboratory, in a letter in the May 1993 *Physics Today*, responding to a comment by Freeman Dyson in a book review

Book Reviews

America's Longest and Costliest Criminal Trial

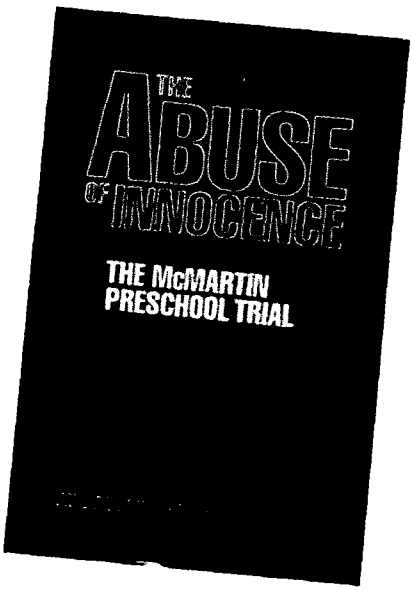
The Abuse of Innocence: The McMartin Preschool Trial. By Paul Eberle and Shirley Eberle. Prometheus Books, Buffalo, N.Y. 1993. 420 pp. Hardcover, $24.95.

LLOYD K. STIRES

Child sexual abuse is a crime the very nature of which invites abuses of due process. It often involves claims of recovery of repressed memories by children, some of whom were quite young at the time of the alleged offenses. Given the heinous nature of the crimes, judges, legislators, and the public have been willing to suspend some of the rights of defendants in the interest of protecting victims from emotional distress. To be falsely accused of such a crime must surely be a nightmare.

In 1983, Peggy McMartin Buckey, director of the McMartin Preschool in Manhattan Beach, California, and her son Raymond were accused of hundreds of instances of child sexual abuse, including rape, oral and anal intercourse, taking pornographic pictures, satanic rituals, abuse of animals, and threatening the children. From 1988 to 1990, they were tried in the longest and costliest trial in American history. Peggy Buckey was acquitted on all counts. Ray Buckey was acquitted on most of the charges. The jury deadlocked on others. His retrial resulted in a second hung jury, at which point the state declined to pursue the matter any further.

Investigative journalists Paul and Shirley Eberle, authors of *The Politics of Child Abuse,* have written a detailed account of the McMartin Preschool trials. After reading their book, I find it hard to escape the conclusions that the defendants were innocent of all charges; that the prosecutors persisted in spite of the knowledge that



their case was extremely weak; and that the judge, the news media, and public opinion were all strongly biased against the defendants.

This case raises some of the most controversial issues in contemporary psychology. To what extent can children accurately report events that took place during their preschool years? Can false memories be implanted by suggestion? Why would therapists suggest false memories to children? What are jurors' reactions to claims of child sexual abuse in which it is essentially a child's word against that of an adult defendant?

Laypeople sometimes think of memory as if one were scanning a videotape of the event. Psychological research shows that eyewitness identification and testimony is much less accurate than this analogy suggests. [See "Eyewitness Testimony: Imperfect Interface Between Stimuli and Story," *SI*, Summer 1993.] The memory of adults can be manipulated relatively easily by leading questions—questions that contain hints of the expected answer, such as, "Was the attacker wearing a mustache?" Children are even more susceptible to suggestive questions. Retelling their story commits witnesses to their recollections, whether they are correct or not. Inaccurate eyewitnesses tend to be just as confident as accurate ones. Since jurors use confidence as a criterion, they believe most eyewitness testimony, whether it is accurate or not (see Doris 1991; Loftus 1979, 1993).

One of the enduring lessons of psychological research concerns the experimenter-expectancy effect (Rosenthal 1966). Researchers can unintentionally communicate their expectations to their subjects, and subjects often respond by telling them exactly what they want or expect to hear. It is hard to imagine a more biased interview procedure than that used in the McMartin case. The interviewers were strongly committed to the defendants' guilt. They placed conformity pressure on the children by telling them that their classmates had reported abuse and had named them as victims. They used anatomically correct dolls and hypothetical questions that encouraged the children to confuse fact and fantasy. They praised the children for answers implicating the defendants. As a result, the few child witnesses who were called to testify may have believed they had been abused, although their recollections were vague, inconsistent, and in some cases contrary to known facts.

Expectancy effects may have also played a role in the willingness of some medical doctors to testify that sexual abuse can be detected from physical examinations many years after the fact. The McMartin jurors were shown dozens of enlarged slides of vaginas and anuses in which small imperfections were interpreted as signs of abuse. Even undamaged anuses were said to be "consistent with the possibility of abuse."

The behavior of the prosecutors seemed to be the result of a premature commitment to the theory that the Buckeys were guilty. By the time they realized how weak their case was, they literally had too much invested to quit. As a result, they resorted to (and the judge permitted) sleazy courtroom tactics intended to create dislike for Ray Buckey, including lengthy but irrelevant testimony claiming that he didn't wear underwear, that he read *Playboy*, and that he believed in the healing power of pyramids.

The Eberles report conferences outside the presence of the jury in which the judge ruled on what testimony he would allow. His decisions seemed one-sided. The defense was

penalized for the fact that it presented its case last. The judge refused to hear crucial defense witnesses on the grounds that the trial was taking too long. In their summation, the prosecutors noted that they had produced seven doctors supporting allegations of child abuse, while the defense had only presented one in rebuttal. Unknown to the jurors, the judge had limited the defense to one doctor to speed up the trial.

We are familiar with the idea of political bias in the news media. Maybe we should think more seriously about the pro-prosecution bias of crime reporting, especially in sensational cases. A defense study showed that before the McMartin trial news stories favored the prosecution by a ratio of 14 to 1, which may explain why 97.5 percent of local residents believed the Buckeys were guilty. The Eberles report their conversations with people who were strongly convinced of the defendants' guilt in spite of their lack of knowledge of the case and had no interest in discussing facts that might have challenged their opinion.

This book is not, strictly speaking, about the McMartin case; it is about the *trials*. It contains four chapters, the longest of which is a 286-page account of the first trial. The testimony of many redundant witnesses is quoted at length from the transcript. The testimony is presented in the order that it was given at the trial rather than according to the chronological order of events and alleged events. The reader must put all this information together. I have mixed feelings about this approach.

On the negative side, the Eberles don't do some of the work we ordinarily expect of journalists. They don't summarize all the facts. They don't provide all the relevant background information. Their book is twice as long as needed, but still leaves some obvious questions unanswered.

On the positive side, this lengthy confrontation with the obvious weaknesses of the prosecution's case is persuasive. If the Eberles had summarized the trial in their own words, they might have been perceived as biased in favor of the defendants.

Of course, some of the jurors heard *all* the evidence and still voted to convict Ray Buckey. The Eberles quote an unidentified psychologist as saying, "The problem is how do you maintain a democracy, when there are so many millions of people who are stupid enough to believe anything?" (p. 343). Are we paying the price of years of neglect of our educational system? Do we have a population of citizens who are unable or unwilling to think critically?

Meanwhile, the story continues. The case of the Little Rascals Day Care Center in Edenton, North Carolina, is similar to the McMartin case—hundreds of allegations of child sexual abuse, psychologists with anatomically correct dolls, etc.—but with one major exception: As of this writing, owner Robert Kelly has been convicted and sentenced to 12 life terms. His wife and several employees are awaiting trial. These are scary times.

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The Secret Life of Things

The Nature of Things: The Secret Life of Inanimate Objects. By Lyall Watson. 1992. Destiny Books, One Park Street, Rochester, VT 05767. 255 pp. Paper $12.95.

ROBERT A. BAKER

Lyall Watson's latest exploration of the farther reaches of the human imagination outdoes all of his previous efforts by a wide margin. In this newest effort the reader is asked to accept as credible the idea that inanimate objects in the world around us have always had a "mind" or "life-force" of their own and, moreover, it has come from and is due to our own creative and emotional nature. As John Steele notes, "Both life and mind are emergent properties of sufficiently complex matter." And Man, both as *homo faber* (the maker) and *homo ludens* (the player), has certainly created and played with some very complex forms of materials.

Recognizing the inherent absurdity of Watson's basic proposition, the publisher as well as Watson himself took steps at the outset to head off criticism. On the cover the publisher quotes Desmond Morris: ". . . There's nothing worse than a closed mind. Lyall Watson has a first-rate scientific brain. His strength lies in his readiness to find and study strange phenomena without the fears that other scientists have!" Other cover blurbs tell us that "Watson logically investigates illogical events," and, further, "We have all experienced those strange moments when things seem to take on lives of their own. Valued possessions return to their owners, houses greet us with a welcome or unfriendly demeanor, lost items turn up in the most unlikely places, and computers misbehave. What's going on?"

Most of us with a grain of common sense and a smidgen of an education know perfectly well what's happening: *nothing!* Watson, however, knows better. He suggests that what we are witnessing is the development of "a new life form," and he insists that we are investing objects with "a life-force" through the attention we give to them. Just how does this come about? Well, according to him, we are surrounded by subtle forces, such as "memory fields," and all matter has the "capacity to absorb emotional 'fingerprints'—the mental fossils that channel echoes from the past." Through stories of sacred stones that sing, lost wedding rings that reappear, and statues of the Virgin Mary that weep, Watson demonstrates the complexity of inanimate life and offers possible proof of our sensitivity to its minute, natural patterns of energy. Our observations bring things into existence.

Recognizing that all of this is much too much for even the most credulous reader to swallow, Watson coyly remarks in his conclusions: "The anecdotal nature of much of the evidence for all this has made it necessary for me to trip lightly over the detail, but I am very serious about the thrust of the argument. . . . I believe that it is our destiny to lift, nudge, urge and cajole inanimate matter into life. This is our job. The bright man's burden" (p. 228).

Watson launches his attack on the reader's credulity from the very be-

ginning. In his Introduction he urges us to recognize that "things, even those that are totally inorganic and undeniably inanimate, sometimes behave as though they were alive, on occasion even sentient" (p. 11). He insists that we see our relationship with devices and machines as a sort of "suburban shamanism" and ourselves as "apprentice sorcerers." Is it therefore any wonder that he gleefully confesses that he used the *National Enquirer* and other weeklies as his sources of information. In his own words, "Few scientists and no learned journalists take the subject seriously. I do. Despite the shortcomings of this database I remain impressed with the consistency I find there." After this revelation it should come as no surprise that Watson also tells us that he depended heavily on the work of Charles Fort; he even dedicated the book to Fort.

In Chapter 1, "The Nature of Things," Watson regales us with primitive stories of magical rocks and stones, sacred altars, runes, and legends of singing rocks. Watson asks us to believe in the truth of these things. He insists they are not *merely* legends and folktales. He cites stories of the magical power of Ayres Rock in Australia and takes the Aborigine tales of stone-power as the gospel truth. As further evidence Watson tells us about "homing things," that is, things that people lose that, in believe-it-or-not fashion, return to the loser. Watson is astounded by the fact that several weeks after a woman dropped her wedding ring into the lake, she found it in the stomach of a fish she caught in the same lake. Such things boggle Watson's mind and, for him, prove the existence of "thing" power. So do quartz crystals, which Watson is convinced have minds of their own.

In his second chapter, "The Origin of Things," Watson pays a debt of gratitude to one obscure seer with the unlikely name of Ion Will. According to this esteemed guru, "Metaphors are living things" that soon turn into *Metaphorms*, that is, ideas that take on an existence in the real world. Since psychologists (according to Watson and Will) can't tell you what perception and seeing are or mean, there are other similar things we (Watson and Will) don't understand. Watson cites the violins crafted by Stradivarius as an example. Watson finds it absolutely incredible that every one of the violins Stradivarius made has excellent tone and timbre. Watson cannot believe that Stradivarius "got it right 600 times—it couldn't be due to chance." Watson is correct, it wasn't due to chance; it was due to skill and craftmanship. Watson's major point is that the violin itself is alive and it "influences the way you play." Watson next turns to dowsing as further proof of the life that resides in metal and wood and that is sensitive to concentrations of water, metals, and so on. The most convincing work of all, as far as Watson is concerned, was that carried out by the notorious Rhodes Buchanan around the turn of the century. Called "psychometry," this pseudoscientific bit of flim-flam argues that material objects give off some sort of subtle emanation that certain sensitives are able to feel and interpret. Psychometry also forms the basis for the belief that psychics can divine the history of, or events connected with, material objects with which they come in close contact. Modern ghost theory also rests upon the assumption that material objects in the environment soak up or absorb human emotional energy and when psychics, at a later time, enter this environment they can pick up and interpret these emotions and energies.

Nowadays it is hard to believe that

anyone takes this seriously. Houdini, around the turn of the century, routinely would confound and embarrass such psychics by giving them artifacts of living females and telling them they were objects of dead males. Those who remember James Randi's TV show of a few years back will also recall that the psychometrist failed miserably to correctly connect the watches, rings, keys, and so on, with their proper owners. Watson, however, cites as convincing evidence, for him, the story of an engineer in London before World War II who was correct 34 percent of the time in connecting objects with their owners. Watson also notes that the engineer, amazingly, "scored best with things belonging to people he knew"! Watson next calls upon "Earth Magic," which is the theory that there are "good" places and there are "bad" places. In the latter category are haunted houses peopled by ghosts. Watson tells us that "we make the world up as we go along." Information, it seems, is trapped not only in crystals but in water as well.

In another chapter we learn that since the beginning of time people have made statues and idols, have endowed them with lifelike qualities, and worshipped them. Now we have statues that bleed, shed tears, and glow with a holy light. Doors and paintings—particularly of religious figures—also weep and shed blood.

In another chapter Watson gets into the world of machines. He says that many machines seem to be jinxed or evil and actually strike back at their makers and owners. As evidence he cites the large number of automotive recalls and James Dean's fatal crash, which apparently, Watson says, was more the fault of the car than of its driver.

In his seventh and final chapter, "The Ghost in the Machine," we learn that machines have it in for us and that we can and do interact with them as if they were living things! Watson's evidence: Ted Serios's ability to impress his thoughts on film inside a camera; reports of house lights that go on and off by themselves; telephone-line mixups and phone calls from dead people, as argued by Scott Rogo and Raymond Bayless. We also have heard that tea kettles in England send mystic messages to cleaning ladies and that chain saws have been known to sing while church organs occasionally broadcast shipping forecasts. Moreover, many psychics claimed to capture the voices of the dead on audio tape. Many people seem to send forth electric signals and emanations that mess up various electrical and electronic devices. Robert Jahn's work at Princeton also shows that people can influence energy radiations at very low or weak levels of output. All of these things are accepted unquestionably by Watson and prove to him that material things are alive and have minds of their own. His *pièce de résistance* is that in 1981 Kenji Urada, a Japanese factory worker at Kawasaki Heavy Industries in Akashi, was beaten to death by a robot's arm, and artificial intelligence and berserk computers a few years ago almost brought about World War III.

Watson has been writing such things for well over two decades, beginning with *Supernature* (Doubleday, 1973), *Lifetide* (Simon and Schuster, 1979), and *Beyond Supernature* (Bantam Books, 1988). He has surprisingly overlooked the "powder of sympathy," an idea promulgated by Sir Kenelm Digby (1603-1665), who enjoined the medical fraternity of his time to employ "weapons salve" to heal battlefield injuries. A soldier's wound was cleaned and covered with a bandage, then a salve was applied

not to the wound but to the weapon that had caused it. If the weapon was unavailable, a piece of bloody clothing was dipped in the salve. Strangely enough it worked. The wounds did indeed heal more quickly when the ointment was applied to the weapon than when it was applied to the wound. Why? Because the bacteria-infected salves and powders caused infection; treating the weapons didn't!

In *Beyond Supernature*, Watson argued: "Given wide public interest in the supernatural, it was probably inevitable that it should become big business and suffer from all the distortions of the marketplace. I am ruefully aware of having helped to create this situation and accept my share of responsibility for fueling enthusiasms which have, in some cases, got out of hand. Our culture, however, is prone to such excesses" (p. 2). Watson is, obviously, incorrigible, and when he "rues" he doesn't overdo. This latest work is medieval in attitude, concept, and execution.

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Science, Myth, and Cosmos

Conversing with the Planets: How Science and Myth Invented the Cosmos. By Anthony Aveni. Times Books, New York, 1992. 255 pp. (30 photos). Hardcover, $21.00.

L. STEPHEN COLES

Clearly I have mixed feelings about this book. The more I got into it, the more I became enchanted, not only by the material itself but by the author's lucid writing style. Anthony Aveni, a professor of astronomy at Colgate University, has pioneered a new discipline that is usually called "archaeoastronomy" but might be called "astronomical anthropology." There are extended discussions of calendrical systems (Mayan, Babylonian, Chinese, Julian, etc.) and even an exposition of the logical basis for astrology. The deciphering of Mayan hieroglyphics and Babylonian cuneiform writing with respect to the planet Venus was brilliant, like a detective story laid out before one's eyes. Obviously, the methods of science were being used to understand the minds of the ancient "naked-eye" astronomers in a way that allowed crosscultural comparisons and, as an added insight, more clearly revealed the hidden agenda of the ruling classes of those times.

Over the past couple of years, as I myself have walked along the thoroughfares of the ruins of Chichen Itza and Tulum, I felt the same sort of warm, positive feelings that I usually experience while walking on a modern college campus. Of course I tried to imagine the collegial atmosphere of these ruins as they might have been when they were newly built structures and not crumbling ruins. In the

struggle to understand how these civilizations achieved such extraordinary heights and then fell into decline (a period of drought, maybe, that led to famine and/or an invasion by barbarians from a rival city state), one tries to empathize with the historical inhabitants. What were they doing? What were they thinking? Why didn't they explore their surroundings more? Or if they did, why didn't they record their discoveries in the form of maps (in Europe cartography was as popular as astronomy)? There doesn't seem to be any evidence that these civilizations, after building a complex infrastructure of roads through the jungle for trade between cities, ever knew anything about the geography of their Caribbean area. Was it the lack of appropriate domesticated animals? Was it the lack of sailing vessel technology? In other words, if they were so smart, why didn't they discover us, instead of us (Europeans) discovering them? Most puzzling of all, if they were so knowledgeable and "civilized," judging by their mathematical calendar-making skills, how come they indulged in ritual human sacrifice (regularly cutting out victims' hearts with a stone knife)? Today, we would consider such a practice barbaric and highly *un*civilized.

How can we build an accurate model of these peoples to explain their rise and subsequent decline? Moreover, what will be the "epistemological adequacy" of such models? How can we be sure that the models we construct of the Mayans will not be flawed in some fundamental way? *Conversing with the Planets* clearly provides an excellent start at answering some of these intriguing mysteries. Through reading these chapters, one achieves a feeling of intimacy with these ancient peoples, looking at things from their point of view, and an understanding of how their perceptions must have influenced their own model of the world. Certainly, for them, the inanimate world was a much more lively, dynamic sort of place, impacting humans more by "intent" (teleology) than by "cause-and-effect" (ontology). Indeed, the main premise of the book is that *truth* is relative, defined by who we are and what we already believe. By bringing our own cultural prejudices to bear on an interpretation of the artifacts that remain of ancient civilizations, we can easily miss the point or overlook the value of their accomplishments. Our assumptions regarding the inevitability of our own progress, which openly discredits the past for lacking our modern perspective, can give us a false sense of superiority over ancient "primitive" peoples. When we come to realize that our own time is merely a snapshot in the long eye of history, we regain some perspective (humility).

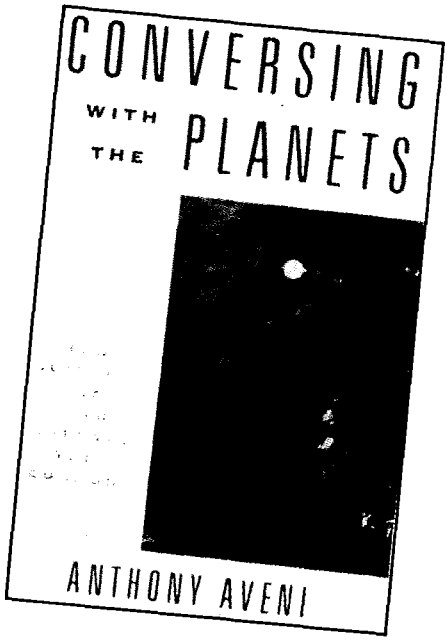
The breadth of Aveni's exposition certainly rewarded me with an appreciation for ancient peoples. I fully sympathized with the author's outrage over the burning of ancient manuscripts by the Spanish conquistadors on the ground that such superstitious work was inspired by the Devil and would interfere with the conversion of the natives to Roman Catholic Christianity. I also felt a strong sympathy for the plight of Galileo at the time of his inquisition.

Then, suddenly, when I hit page 212, something bizarre happened. From pages 212 to 224 the author appears to go into an alien time warp. He literally advocates *abandoning the scientific method* as a way to understand the world in our own times, on the grounds that it has outlived its usefulness! To quote directly from *Conversing with the Planets:*

Magellan [the radar images of the planetary mission, not the explorer] has carried us beyond the veil of the love goddess [Venus]. We have depersonalized Mother Nature, convincing ourselves that the material world exists and behaves strictly in its own self-interest [like a mechanical clock]. But we are beginning to pay the price of living in a motherless world. We have become the outsiders, onlookers who can only helplessly watch the interactions among forces and entities that have neither care nor cause for us. We have become bewildered by a universe that we still want to regard as nurturing, yet one we see filled with so much violence, unpredictability, and chaos—a universe as fickle and uncaring as Ishtar the morning after [another allusion to Venus]. We struggle in our new covenant to control nature, and, although we find containment at the local level manageable, the big picture throws up overwhelming prospects we know we never can contend with. Cosmologists may think they can read God's palm, but they cannot keep the sun from evolving nor the universe from expanding [Big Bang].

Aveni then rationalizes that ordinary citizens are then justified in clinging to newspaper astrology, UFO interpretations of uncertain visual observations, and reincarnation. He goes on to embrace a sort of New Age ideology that "shatters the arrow of time and its cause-and-effect physical explanations. All Nature becomes a conscious being. We must reject a mechanistic interpretation of Voyager's data about Jupiter, Saturn, Uranus, and Neptune." Gasp!

Well, this reviewer flatly rejects such absurdities. And it would make this book especially dangerous if, as a result, the nonscientific public were to perceive such propaganda as the *reasoned conclusion of science itself,*



since it seems to be arrived at after an extensive and wonderful use of the scientific method. The practice of astrology was respectable for the ancient Mayans because it was consistent with their world model. Frightening omens (eclipses) or the locations of Venus were signs to clarify their relation to the awesome powers of nature, to create order out of uncertainy. Rainbows were created not by chance weather conditions but by the gods as a means to declare their power. The destiny that controlled them was obviously the result of complex influences created by celestial spirits. These gods allegedly intervened whenever they were "unhappy" about something, thereby explaining all sorts of earthly *adversity* (famines, droughts, floods, hurricanes, etc.). As a consequence, this justified the requirement for divine appeasement through collective animal or even human sacrifice, performed outside so the gods could "watch."

If the planets don't flicker like the

stars, do they give off their own light? Or is it reflected? Does Atlas or do elephants and tortoises really hold up the Earth? My personal response to the complaints expressed by the author at the end of this book is that "if science winds up teaching us that the universe is a clock [a mechanism] in which god [the creator] left us 'home alone,' then, so be it!" It's time for us to grow up, anyway. And let's not "throw out the baby with the bathwater," but let's get on with real science. There's still a lot more to learn about the universe, such as why we age and how the brain works.

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Chronicles of Credulity

UFO Chronicles of the Soviet Union: A Cosmic Samizdat. By Jacques Vallee. Ballantine Books, New York, 1992. 212 pp. Hardcover, $18.00.

ERIK VAUGHN

When the reports of UFO landings in Voronezh broke in the Western press in 1989, Jacques Vallee was perturbed with the media's handling of the story. In his view, they did not investigate the matter before ridiculing it, and they "garbled" what he considered the "real" story. By printing "bilocation" instead of "biolocation," the media missed the fact that Soviet investigators had used *dowsing* to verify the landings. To Vallee, this was a most significant development.

The media's scandalous treatment of the event, the remarks of flippant "shoot from the hip" debunkers, and the curious appearance of the UMMO hoax insignia provoked Vallee's determination to go to Moscow and see things for himself. Based on interviews with UFO investigators, experts, scientists, journalists, cosmonauts, writers, New Age healers, and one skeptic, Vallee sketches his view of the present state of UFO research in the Soviet Union and the innovations UFOlogists have introduced to the discipline.

Vallee discovers that, as Soviet society experiences the freedoms of *glasnost* and the empire verges on disintegration, UFOs are part of this "enormously vital change." Vallee thinks the UFO phenomenon even may have contributed to the fall of the Berlin Wall.

In his view, Soviet UFOlogists were fortunate that, after years of official opprobrium and censorship, the wave of UFO activity coincided with their freedom to make their findings public. Sheltered from the "pointless fights" between abductionist and conspiracy "gurus," they were prepared to analyze events with open minds, which Vallee finds refreshing after the dogmatism of their counterparts in the West. Vallee appears to believe that Soviet investigators have taken

a "scientific approach" to the UFO problem.

There were several landings in Voronezh, but Vallee devotes most attention to the episode in South Park on September 27, 1989, where reports said children watched a "red sphere . . . forty-five feet by nineteen feet [*sic*]" land and a being "nearly ten feet tall" emerge with a robot. The alien "froze" one boy; then the alien, the robot, and the ship disappeared. When they reappeared, the being caused another boy to disappear, then re-entered the craft and flew away, the boy reappearing at the same moment.

Vallee believes the children's testimony is best corroborated by the adult witnesses, many of whom saw red spheres during that period. For him, the "idea of a few teenagers fantasizing about giants in the park had to be eliminated," but no adult witnesses to the landing are named, only the children.

Even UFOlogists admit that over 90 percent of sightings reported by children, particularly teenagers, are hoaxes. The adults Vallee is able to cite describe what sounds very much like a weather balloon, not something that has "no current scientific explanation." Their sightings do not prove the landings occurred, but instead point to the possibility that weather balloons, in conjunction with the UFO hysteria sweeping the country, caused some excitement, which imaginative children then elaborated into a full-blown landing.

Perhaps the most damaging evidence that the Voronezh landings are a fabrication is the appearance of the UMMO "}H{" insignia in a drawing of the craft. UMMO is said to be the home planet of a group of aliens, now residing in Spain, who flew saucers suspended from strings and issued documents that gave rise to a veritable cult. The UMMO story is considered

"The Soviet UFO experience is not an independent part of a worldwide phenomenon; it has been greatly influenced by decades-old Western literature."

to be a hoax by many, and the insignia caused Vallee's French colleagues to reject the Voronezh affair out of hand.

Vallee notes that a report containing the insignia was available in Voronezh before the landings, and he asserts the symbol was added to the drawing in a "misplaced effort to increase its credibility," a "spurious addition, the result of unfortunate contamination." Despite Vallee's attempt to salvage the situation, it is hard to escape the conclusion that the children had prior knowledge of UFOs and that it helped inspire their prank.

The use of "biolocation" to investigate and validate the landings puzzled Vallee. Magnetometers were used and radiation counts taken, but these were then corroborated by "biolocation." For investigators it was "as obvious as measuring electrical tension with a voltmeter," but Vallee "failed to see any calibration, any reliable baseline to their measurements. Obviously, I was missing something. . . ."

Professor Alexis Zolotov, of the Geophysical Institute in Kalinin, an "expert in magnetism" and an exponent of the spaceship-explosion-over-Tunguska theory, explains that it is "impossible to deny the existence of certain fields around living beings," that "every living entity generates a

biological field," and that it is an "independent physical field, not yet recognized." The field is positive in some areas but negative in others, and can be "detected by people trained in biolocation" or sensed as "discomfort" in negative zones and "euphoria" in positive ones. The field can affect the mechanism of a watch, can enable a blind "sensitive" to diagnose illness with a sugar cube, or, with a diploma from the Institute, it can be used in mineral exploration. UFOs affect the biological field in a "pattern we have learned to recognize." In Voronezh, "bioenergy" levels dropped to zero where the UFO had been on the ground.

Vallee tacitly accepts the reality of biological fields since they could explain paranormal phenomena and might provide a means of communication with extraterrestrials. He writes that dowsing is "supported by . . . . tantalizing laboratory research," but he is at a loss to understand the reliability researchers ascribe to it and concludes he has "much to learn in this area."

Zolotov offers no evidence to support a theory based on folklore. Controlled scientific experiments have demonstrated that dowsing is little more than the subjective response of the diviner. Zolotov's "biological field" is a melange of geomancy, water witching, and psychic-like trickery. He remarks that "ten years ago . . . people would have said we were dealing with mystical nonsense!" Ten years later it is still mystical nonsense.

Turning to the Perm region, an area a thousand miles east of Moscow in the Urals, Vallee observes that it is a hot spot where "UFOs, globes of light and weird electrical phenomena have been reported for decades." Expeditions have "brought back no proof," but "globes of light" and "energy fields" have been captured on film and constitute the most objective evidence Vallee has brought back.

Vallee is assured that precautions were taken to prevent freezing temperatures from affecting the emulsion, so he concludes the lights are an as-yet-unexplained phenomenon. The "energy fields," on the other hand, are readily identifiable as the aurora borealis, with the Big Dipper clearly visible in the sky. Vallee can't understand how the UFOlogists could mistake a familiar sight for "unexplained energy fields," but says, "Perhaps we were being tested."

Nowhere does Vallee suggest he passed this "test" or challenged the "evidence." This "mistake" calls into question the light-globe photographs, which do appear to be the result of film artifacts or the frozen breath of the investigators.

Clearly the competence or motivation of these investigators and other "experts" is in serious doubt. Vallee admits that much "Soviet UFO data is poorly documented" and "surrounded by irrelevant facts" and that "their whole methodology . . . has yet to be independently tested," but that does not alter his view that their research and conclusions are reliable and sound.

How can Vallee express confidence in what is either extremely flawed or outright counterfeit science? Vallee considers free inquiry constrained by science and skepticism a barrier, and says at one point that "genuine UFO data are buried within hoaxes, undocumented tales, and an enormous mass of wishful thinking." If real information can be extracted from fake facts, hearsay, and fantasy, then no data is so corrupt, no methodology so contrived, that it cannot produce desired results. This is pseudoscience evaluating its kin and pronouncing it legitimate.

Bogus science aside, *UFO Chronicles* makes it evident that the Soviet UFO experience is not an independent part of a worldwide phenomenon; it has been greatly influenced by decades-old Western literature, from sightings of airships and flying cylinders right down to their own contactee cults, things not popular in the West since the 1950s. Vallee actually stumbles upon one probable source of this Western influence in the Soviet Union—the *samizdat*, a text of government suppressed literature secretly copied and "circulated among trusted friends." Far from being isolated, the Soviets have been exposed to an untold number of Western works.

Finally, instead of showing Soviet UFOlogists to be "serious, thorough, and diligent" in their efforts, Vallee reveals them to be as inept and credulous as their Western colleagues. For that Vallee has performed an inestimable, if unintended, service.

Erik Vaughn is a writer living in Los Angeles, California.

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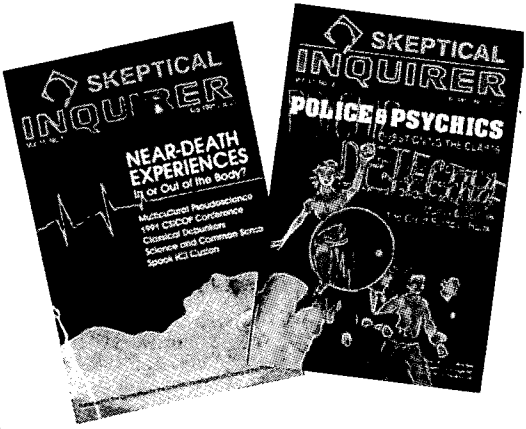

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FALL 1991 (vol. 16, no. 1): Near-death experiences, *Blackmore.* Multicultural pseudoscience: Spreading scientific illiteracy, Part 1, *de Montellano.* Science and commonsense skepticism, *Aach.* Spook Hill, *Wilder.* Lucian and Alexander, *Rowe.* 1991 CSICOP conference, *Shore* and *Frazier.*

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SPRING 1991 (vol. 15, no. 3): Special report: Hi-fi pseudoscience, *Davis.* Searching for extraterrestrial intelligence: An interview with *Thomas R. McDonough* Getting smart about getting smarts, *Faulkes.* Carrying the war into the never-never land of psi: Part 1, *Gill.* Satanic cult 'survivor' stories, *Victor.* 'Old-solved mysteries': The Kecksburg incident, *Young.* Penn & Teller, the magical iconoclasts, *Gordon.* Magic, medicine, and metaphysics in Nigeria, *Roder.* What's wrong with science education? Look at the family, *Eve.*

WINTER 1991 (vol. 15, no. 2): Special report / Gallup poll: Belief in paranormal phenomena, *Gallup and Newport.* Science and self-government, *Piel.* West Bank collective hysteria episode, *Stewart.* Acceptance of personality test results, *Thiriart.* Belief in astrology: A test of the Barnum effect, *French, Fowler, McCarthy, and Peers.* A test of clairvoyance using signal-detection, *McKelvie and Gagné* Intercessory prayer as medical treatment? *Wittmer and Zimmerman.*

FALL 1990 (vol. 15, no. 1): Neural Organization Technique: Treatment or torture, *Worrall.* The spooks of quantum mechanics, *Stenger.* Science and Sir William Crookes, *Hoffmaster.* The 'N' machine, *Cumming.* Biological cycles and rhythms vs. biorhythms, *Wheeler.* 1990 CSICOP Conference.

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(continued on next page)

Lying about polygraph tests, *Shneour.* Worldwide disasters and moon phase, *Kelly, Saklofske, and Culver.*

WINTER 1990 (vol. 14, no. 2): The new catastrophism, *Morrison and Chapman.* A field guide to critical thinking, *Lett.* Cold fusion: A case history in 'wishful science'? *Rothman.* The airship hysteria of 1896-97,*Bartholomew.* Newspaper editors and the creation-evolution controversy, *Zimmerman.* Special report: New evidence of MJ-12 hoax, *Klass.*

FALL 1989 (vol. 14, no. 1): Myths about science, *Rothman.* The relativity of wrong, *Asimov.* Richard Feynman on fringe science. Luis Alvarez and the explorer's quest, *Muller.* The two cultures, *Jones.* The 'top-secret UFO papers' NSA *won't* release, *Klass.* The metaphysics of Murphy's Law, *Price.*

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SPRING 1989 (vol. 13, no. 3): High school biology teachers and pseudoscientific belief, *Eve and Dunn.* Evidence for Bigfoot? *Dennett.* Alleged pore structure in Sasquatch footprints, *Freeland and Rowe.* The lore of levitation, *Stein.* Levitation 'miracles' in India, *Premanand.* Science, pseudoscience, and the cloth of Turin, *Nickell.* Rather than just debunking, encourage people to think, *Seckel.* MJ-12 papers 'authenticated'? *Klass.* A patently false patent myth, *Sass.*

WINTER 1989 (vol. 13, no. 2): Special report: The 'remembering water' controversy, *Gardner and Randi;* Bibliographic guide to the 'dilution controversy.' Pathologies of science, precognition, and modern psychophysics, *Jensen.* A reaction-time test of ESP and precognition, *Hines and Dennison.* Chinese psychic's pill-bottle demonstration, *Wu Xiaoping.* The Kirlian technique, *Watkins and Bickel.* Certainty and proof in creationist thought, *Leferrière.*

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SUMMER 1988 (vol. 12, no. 4): Testing psi claims in China, *Kurtz, Alcock, Frazier, Karr, Klass, and Randi.* The appeal of the occult: Some thoughts on history, religion, and science, *Stevens.* Hypnosis and reincarnation, *Venn.* Pitfalls of perception, *Wheeler.* Wegener and pseudoscience: Some misconceptions, *Edelman.* An investigation of psychic crime-busting, *Emery.* High-flying health quackery, *Hines.* The bar-code beast, *Keith.*

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WINTER 1987-88 (vol. 12, no. 2): The MJ-12 papers: Part I, *Philip J. Klass.* The aliens among us: Hypnotic regression revisited, *Baker.* The brain and consciousness: Implications for psi, *Beyerstein.* Past-life hypnotic regression, *Spanos.* Fantasizing under hypnosis, *Reveen.* The verdict on creationism, *Gould.*

FALL 1987 (vol. 12, no. 1): The burden of skepticism, *Sagan.* Is there intelligent life on Earth? *Kurtz.* Medical Controversies: Chiropractic, *Jarvis;* Homeopathy, *Barrett, M.D.;* Alternative therapies, *Jones;* Quackery, *Pepper.* Catching Geller in the act, *Emery.* Special Report: CSICOP's 1987 conference.

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SPRING 1987 (vol. 11, no. 3): The elusive open mind: Ten years of negative research in parapsychology, *Blackmore.* Does astrology need to be true? Part 2: The answer is no, *Dean.* Magic, science, and metascience: Some notes on perception, *D. Sagan.* Velikovsky's interpretation of the evidence offered by China, *Lo.*

WINTER 1986-87 (vol. 11, no. 2): Case study of West Pittston 'haunted' house, *Kurtz.* Science, creationism and the Supreme Court, *Seckel,* with statements by *Ayala, Gould,* and *Gell-Mann.* The great East Coast UFO of August 1986, *Oberg.* Does astrology need to be true? Part 1, *Dean.* Homing abilities of bees, cats, and people, *Randi.*

FALL 1986 (vol. 11, no. 1): The path ahead: Opportunities, challenges, and an expanded view, *Frazier.* Exposing the faith-healers, *Steiner.* Was Antarctica mapped by the ancients? *Jolly.* Folk remedies and human belief-systems, *Reuter.* Dentistry and pseudoscience, *Dodes.* Atmospheric electricity, ions, and pseudoscience, *Dolezalek.* Noah's ark and ancient astronauts, *Harrold and Eve.* The Woodbridge UFO incident, *Ridpath.* How to bust a ghost, *Baker.*

SUMMER 1986 (vol. 10, no. 4): Occam's razor, *Shneour.* Clever Hans redivivus, *Sebeok.* Parapsychology miracles, and repeatability, *Flew.* The Condon UFO study, *Klass.* Four decades of fringe literature, *Dutch.* Some remote-viewing recollections, *Weinberg.*

SPRING 1986 (vol. 10, no. 3): The perennial fringe, *Asimov.* The uses of credulity, *de Camp.* Night walkers and mystery mongers, *Sagan.* CSICOP after ten years, *Kurtz.* Crash of the crashed-saucers claim, *Klass.* A study of the Kirlian effect, *Watkins and Bickel.* Ancient tales and space-age myths of creationist evangelism, *McIver.*

WINTER 1985-86 (vol. 10, no. 2): The moon was full and nothing happened, *Kelly, Rotton, and Culver.* Psychic studies: The Soviet dilemma, *Ebon.* The psychopathology of fringe medicine, *Sabbagh.* Computers and rational thought, *Spangenburg and Moser.*

FALL 1985 (vol. 10, no. 1): Investigations of firewalking, *Leikind and McCarthy.* Firewalking: reality or illusion, *Dennett.* Myth of alpha consciousness, *Beyerstein.* Spirit-rapping unmasked, *V. Bullough.* The Saguaro incident, *Taylor and Dennett.*

SUMMER 1985 (vol. 9, no. 4): Guardian astrology study, *Dean, Kelly, Rotton, and Saklofske.* Astrology and the commodity market, *Rotton.* The hundredth monkey phenomenon, *Amundson.* Responsibilities of the media, *Kurtz.* 'Lucy' out of context, *Albert.*

SPRING 1985 (vol. 9, no. 3): Columbus poltergeist: I, *Randi.* Moon and murder in Cleveland, *Sanduleak.* Image of Guadalupe, *Nickell and Fischer.* Radar UFOs, *Klass.* Phrenology, *McCoy.* Deception by patients, *Pankratz.* Communication in nature, *Orstan.*

WINTER 1984-85 (vol. 9, no. 2): The muddled 'Mind Race,' *Hyman.* Searches for the Loch Ness monster, *Razdan and Kielar.* Final interview with Milbourne Christopher, *Dennett.* Retest of astrologer John McCall, *Ianna and Tolbert.*

FALL 1984 (vol. 9, no. 1): Quantum theory and the paranormal, *Shore.* What is pseudoscience? *Bunge.* The new philosophy of science and the 'paranormal,' *Toulmin.* An eye-opening double encounter, *Martin.* Similarities between identical twins and between unrelated people, *Wyatt et al.* Effectiveness of a reading program on paranormal belief, *Woods,* Pseudoscientific beliefs of 6th-graders, *A. S. and S. J. Adelman.*

SUMMER 1984 (vol. 8, no. 4): Parapsychology's past eight years, *Alcock.* The evidence for ESP, *C. E. M. Hansel.* $110,000 dowsing challenge, *Randi.* Sir Oliver Lodge and the spiritualists, *Hoffmaster.* Misperception, folk belief, and the occult, *Connor.* Psychology and UFOs, *Simón.*

SPRING 1984 (vol. 8, no. 3): Belief in the paranormal worldwide: Mexico, *Mendez-Acosta;* Netherlands, *Hoebens;* U.K., *Hutchinson;* Australia, *Smith;* Canada, *Gordon;* France, *Rouzé.* Debunking, neutrality, and skepticism in science, *Kurtz.* University course reduces paranormal belief, *Gray.* The Gribbin effect, *Roder.* Proving negatives, *Pasquarello.*

WINTER 1983-84 (vol. 8, no. 2): Sense and nonsense in parapsychology, *Hoebens.* Magicians, scientists, and psychics, *Ganoe and Kirwan.* New dowsing experiment, *Martin.* The effect of TM on weather, *Trumpy.* The haunting of the Ivan Vassilli, *Sheaffer.* Venus and Velikovsky, *Forrest.*

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SUMMER 1983 (vol. 7, no. 4): Project Alpha: Part 1, *Randi.* Goodman's 'American Genesis,' *Feder.* Battling on the airwaves, *Slavsky.* Rhode Island UFO film, *Emery.*

SPRING 1983 (vol. 7, no. 3): Iridology, *Worrall.* The Nazca drawings revisited, *Nickell. People's Almanac* predictions, *Donnelly.* Test of numerology, *Dlhopolsky.* Pseudoscience in the name of the university, *Lederer and Singer.*

WINTER 1982-83 (vol. 7, no. 2): Palmistry, *Park.* The great SRI die mystery, *Gardner.* The 'monster' tree-trunk of Loch Ness, *Campbell.* UFOs and the not-so-friendly skies, *Klass.* In defense of skepticism, *Reber.*

FALL 1982 (vol. 7, no. 1): The prophecies of Nostradamus, *Cazeau.* Prophet of all seasons, *James Randi.* Revival of Nostradamitis, *Hoebens.* Unsolved mysteries and extraordinary phenomena, *Gill.* Clearing the air about psi, *Randi.* A skotography scam, *Randi.*

SUMMER 1982 (vol. 6, no. 4): Remote-viewing, *Marks.* Radio disturbances and planetary positions, *Meeus.* Divining in Australia, *Smith.* "Great Lakes Triangle," *Cena.* Skepticism, closed-mindedness, and science fiction, *Beyerstein.* Followup on ESP logic, *Hardin and Morris* and *Gendin.*

SPRING 1982 (vol. 6, no. 3): The Shroud of Turin, *Mueller.* Shroud image, *McCrone.* Science, the public, and the Shroud, *Schafersman.* Zodiac and personality, *Gauquelin.* Followup on quantum PK, *Hansel.*

WINTER 1981-82 (vol. 6, no. 2): On coincidences, *Ruma Falk.* Croiset: Part 2, *Hoebens.* Scientific creationism, *Schadewald.* Follow-up on 'Mars effect,' *Rawlins,* responses by *CSICOP Council* and *Abell and Kurtz.*

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SUMMER 1981 (vol. 5, no. 4): Investigation of 'psychics,' *Randi.* ESP: A conceptual analysis, *Gendin.* The extroversion-introversion astrological effect, *Kelly and Saklofske.* Art, science, and paranormalism, *Habercom.* Profitable nightmare, *Wells.* A Maltese cross in the Aegean? *Loftin.*

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WINTER 1980-81 (vol. 5, no. 2): Fooling some people all the time, *Singer and Benassi.* Recent perpetual motion developments, *Schadewald.* National Enquirer astrology study, *Mechler, McDaniel, and Mulloy.* Science and the mountain peak, *Asimov.*

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FALL/WINTER 1976 (vol. 1, no. 1): Dianetics, *Wallis.* Psychics and clairvoyance, *Fine.* "Objections to Astrology," *Westrum.* Astronomers and astrophysicists as astrology critics, *Kurtz and Nisbet.* Biorhythms and sports, *Fix.* Von Däniken's chariots, *Omohundro.*

New Books

The Port Orford, Oregon Meteorite Mystery. Roy S. Clarke Jr., editor. (Smithsonian Contributions to the Earth Sciences Number 31.) Smithsonian Institution, Washington, D.C., 1993. In 1858, John Evans, an explorer under government contract, revealed fragments he claimed to have removed from a ten-ton meteorite in the mountains of Oregon. For a hundred years people have searched for this missing pallasite. The authors of the two papers in this book argue that it was a hoax, and demonstrate how Evans probably acquired the fragments.—*Robert Lopresti*

Satanic Panic: The Creation of a Contemporary Legend. Jeffrey S. Victor. Open Court Publishing Co., P.O. Box 599, Peru, IL 61354. 1993. 408 pp. $38.95, hardcover; $16.95, paperback. SUNY sociology professor, who wrote one of the articles in our series on this subject (*SI*, 14:287, Spring 1990), presents a sociological and psychological investigation not into Satanism itself but into rumors, claims, and allegations about satanic cult crime and widely held beliefs about dangerous satanic influences in society. Places the evolution of the satanic-cult legend into the context of our understanding of emotional disturbances, the creation of modern legends and folklore, the dynamics of rumor-panics, the search for scapegoat-deviants, the social construction of imaginary deviance, and the organization and politics of moral crusades.

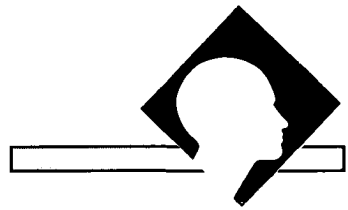
Science Under Siege: Balancing Technology and the Environment. Michael Fumento. William Morrow and Co., New York, 1993. 448 pp. $27.50, hardcover. Well-researched critical examination of numerous claims of environmental hazards and disasters. Focuses on the major "micro" environmental issues—things that may occur all over the country or even all over the planet, but are still localized in their effect. Detailed, critical case studies of the Alar alarm, the politics of cancer testing, pitfalls of epidemiology, dioxin, Agent Orange, food-irradiation scares, and misinformation about electromagnetic radiation and video display terminals. More general chapters examine the issue of risk-taking and how to spot smelly arguments. Fumento says his goals include helping us to see which claims are based upon scientific evidence and which aren't, which are real and which exaggerated, and to make judgments on the people—including environmental activists, politicians, bureaucrats, and journalists—who direct the debate and make decisions that affect us all.

Uncommon Sense: The Heretical Nature of Science. Alan Cromer. Oxford University Press, 200 Madison Ave., New York, N.Y. 10016, 1993. 240 pp. $22.00. Physicist and educator argues that science is not the natural unfolding of human potential but the invention of a particular culture, ancient Greece, and that it goes so much against the grain of conven-

tional thought that it may well have otherwise not been invented. Science and objective thinking are unnatural human activities and must continually struggle against our innate egocentric, subjective selves. Includes chapters on aspects of science, mind and magic, prophets and poets, theorems and planets, sages and scholars, science and nonsense, and education for an age of science.

—*Kendrick Frazier*

Articles of Note



Ayala, Francisco J., and Bert Black. "Science and the Courts." *American Scientist*, May-June 1993, pp. 230-239. A major review by a prominent geneticist-philosopher and an attorney of the debate over how courts should handle expert testimony. They say judges should probe the reasoning behind scientists' testimony and not take it at face value. The issue is now before the U.S. Supreme Court.

Begg, Ian Maynard, Douglas R. Needham, and Marc Bookbinder. "Do Backward Messages Unconsciously Affect Listeners? No." *Canadian Journal of Experimental Psychology*, 47:1-14, 1993. Title gives the conclusion of this study in which subjects listened to digitized statements played backwards and then were tested for recognition memory.

Bennetts, Leslie. "Nightmares on Main Street." *Vanity Fair*, June 1993, pp. 42-62. Lengthy, generally balanced report on the startling number of women coming forward claiming repressed childhood memories of satanic cults and horrifying ritual abuse. Much testimony here from such persons, but article also explores the debate over whether the reports are credible and the problems of false memories.

Blakeslee, Sandra. "Scanner Pinpoints Sites of Thought as People See or Speak." *New York Times*, June 1, 1993, C1. Major Science Times report on the insights being achieved by neuroscientists using improved brain-imaging machines to observe visible changes during specific cognitive processes. "This is the wonder technique we have been waiting for," says one scientist. "At last we can see inside the human brain."

Brown, Malcolm. "In New Spielberg Film, a Dim View of Science." *New York Times*, May 11, 1993, C1, C10. Explores whether the blockbuster movie *Jurassic Park* has an antiscience bias (biotechnology is dangerous; amoral scientists are out of control).

Bynum, Joyce. "Kidnapped by an Alien: Tales of UFO Abductions." *Etc.* 50(1): 86-95, Spring 1993. A folklorist examines UFO abduction tales, looking for elements common to the stories and to earlier legends.

"Criteria for Science in the Courts." *Nature*, April 8, 1993, p. 481. Editorial supports recommendation by a Carnegie Commission study that the Supreme Court adopt a new standard of evidence. It would require judges not to resolve scientific con-

troversy but to ask three pertinent questions in weighing admissibility of evidence: Is the claim testable? Has it been tested? And is the methodology sound?

Fernie, J. Donald. "The Great Moon Hoax." *American Scientist*, March-April 1993, pp. 120-122. Astronomer reviews the "marvelous" hoax perpetrated by journalist Richard Adams Locke of the *New York Sun* in August 1835 in his series claiming Sir John Herschel had observed people, oceans, buildings, and large winged creatures on the moon.

Fox, Richard A. "'The Incredible Discovery of Noah's Ark': An Archaeological Quest?" *Free Inquiry*, Summer 1993, pp. 43-48. An archaeologist's devastating critique of an independently produced two-hour special about Noah's ark purchased by the CBS television network and broadcast February 20, 1993. The program followed the creationist religious agenda throughout. "The claims made in 'Incredible' flatly contradicted the theory and hard-earned knowledge of a dozen or so disciplines. . . ," writes Fox. "The program abused my profession and insulted its practitioners. CBS is responsible." *Free Inquiry* also publishes a one-page statement by the Committee for the Scientific Examination of Religion (CSER) calling CBS "irresponsible" for airing a "so-called documentary that was actually a propaganda vehicle for creationists opposed to the theory of evolution" and demanding that CBS ask its news division to investigate the program. The CSER statement also reveals that a piece of wood presented in the show as a fragment of Noah's ark was actually a forgery, prepared by a California actor from a piece of fresh pine-wood for purposes of testing the thoroughness of the producers' research. Carbon-14 dating would have shown the piece to be modern, but creationists don't believe in carbon dating and it was accepted as an ancient relic. (See Jaroff article below for more on this.)

Frost, Frank J. "Voyages of the Imagination." *Archaeology*, 46(2): 45-51, March/April 1993. Assorted rivals for Columbus have been put forth as discoverers of the new world, including the Chinese, the Japanese, and the Irish. Leif Eriksson's claim is one of the few that appears to hold merit. Frost demonstrates how bizarre phenomena—like sixteenth-century Ming pottery found in American Indian garbage dumps—can have simple explanations.

Goleman, Daniel. "Studies Reveal Suggestibility of Very Young as Witnesses." *New York Times*, June 11, 1993, p. 1. Reports new scientific evidence that "persistent questioning can lead young children to describe elaborate accounts of events that never occurred, even when at first they denied them." Very relevant to trials of child-abuse cases when the child's word is the only evidence and to other recent problems of therapist-induced "pseudomemories."

Hanley, James A. "Jumping to Coincidences: Defying the Odds in the Realm of the Preposterous." *American Statistician*, August 1992, pp. 197-202. Biostatistician explores problems caused by trying to assess probability of seemingly rare events *after the fact*. People, even statistics students, employ selective vision and ignore similar events in the sample space that should be included in the calculated probability. He uses public reactions to four unusual lottery events to argue that they are all variants of a common "probability blind spot" we

all share. He calls on teachers to emphasize proper after-the-fact probability calculations a lot more.

Jaroff, Leon. "Phony Arkaeology." *Time.* July 5, 1993, p. 51. Shows how the CBS pseudodocumentary about Noah's ark (see Fox, above) fell victim to a hoaxer. Skeptical of the producers (Sun International Pictures) and determined to expose their shoddy research methods, Gerald Larue, USC professor emeritus of biblical history and archaeology, coached an actor to present them a piece of modern pinewood from California as a specimen from Noah's ark. They presented him as a Noah's ark "eyewitness" and the piece as a real relic. The show was misleading throughout. "Sun filled the two hours with a mixture of fact, conjecture, fantasy, and arrant nonsense," Jaroff writes, and he quotes legitimate scholars outraged by the program. CBS defends the program as entertainment, not a documentary.

Kurtz, Howard. "Why the Press Is Always Right." *Columbia Journalism Review,* May-June 1993, pp. 33-35. A *Washington Post* reporter and media critic explores some recent prominent media mistakes (by NBC, *USA Today, Time,* and the *New York Post*) and notes that media executives can be just as thin-skinned and stonewalling in the face of criticism as any others. He quotes Steven Brill, chairman of American Lawyer Media: "The press has a great double standard. We spend most of the day holding everyone else accountable, and when it comes to holding ourselves accountable, we say, 'This is bad for morale.' "

McCrone, John. "Roll Up for the Telepathy Test." *New Scientist,* May 15, 1993, pp. 29-33. Good, balanced report on the ganzfeld experiments of the late Charles Honorton, an example of how parapsychology "has steadily changed in response to criticism." Quotes Robert Morris, Susan Blackmore, Ray Hyman.

Monaghan, Peter. "Cryptozoologists Defy Other Scientists' Skepticism . . ." *Chronicle of Higher Education,* 39(23): A7-A9, February 10, 1993. A report on scientists who seek undocumented species, including Bigfoot, as well as surviving members of species believed recently extinct.

Oberg, James. "Space Myths and Misconceptions." *Omni,* May 1993, pp. 39ff. While the public now knows a lot more about space flight, notes Oberg, "much of what it knows is wrong." Four of the examples of misconceptions he cites involve gravity, e.g., the myth that satellites remain in orbit because they have "escaped earth's gravity" (perpetuated by the physically nonsensical phrase "zero gravity"). In fact, they stay in orbit because of their tremendous horizontal speed; they're falling at the same rate as the earth curves away beneath them. Others include the idea that reentering spaceships turn into blazing fireballs because of "the heat of friction" (it's actually the heat of compression).

Oblath, Michael. "Creationism and Appearance of Age—Is Anybody Really Anywhere?" *Creation/Evolution,* 12(1): 5-10, Winter 1992. Some creationists attempt to explain the apparent age of the earth by claiming it was created "already old," but this leads to absurdities, such as light coming from supernovas that exploded before the universe was created.

Ofshe, Richard J. "Inadvertant Hypnosis During Interrogation: False Confession Due To Dissociative State; Misidentified Multiple Person-

ality and the Satanic Cult Hypothesis." *International Journal of Clinical and Experimental Hypnosis*, 40(3): 125-156, July 1992. Paul Ingram pled guilty to charges of rape and involvement in Satanic cults brought by his daughters. Ofshe argues that the confession was based on suggestibility and pseudo-memories misdiagnosed as multiple personality. (See Lawrence Wright article below.)

Rowland, F. Sherwood. "President's Lecture: The Need for Scientific Communication with the Public." *Science*, June 11, 1993, pp. 1571-1576. Thoughtful article by the chairman of the American Association for the Advancement of Science about the serious problems being caused by faulty communication about science among various segments of society, including science itself. One detailed example he gives from his own experience involves his years of research trying to understand the depletion of stratospheric ozone caused by chlorofluorocarbons. Rowland reviews in some detail the underlying science that guides his conclusions before confronting directly what he calls misinformation, misstatements, and massive errors by vocal critics of the consensus ozone-depletion theory. (See also Taubes below.)

Safran, Claire. "Dangerous Obsession: The Truth About Repressed Memories." *McCall's*, June 1993, pp. 98ff. Excellent article on the difficulty of telling whether "repressed memories" of childhood abuse, especially those that come out in therapy, are true or are wild fantasies. Includes five ways to test them (including asking, "Does my therapist seem overeager to believe incest occurred?") and good information on the nature and fallibility of memory.

Stites, Janet. "Running the Numbers: The Ruminations of John Allen Paulos. *Omni*, April 1993, pp. 34ff. The author of *Innumeracy* and *Beyond Innumeracy* wants everyone to enjoy thinking numerically. There's no reason they can't.

Swan, Neil. "Experts Divided on Effectiveness of Acupuncture as a Drug Abuse Treatment." *NIDA Notes*, 7 (5): 8-11, September/October 1992. Three brief articles, all by Swan, on the controversy concerning acupuncture as a treatment for alcoholism and drug addiction. Some studies indicate positive results but other scientists consider them flawed.

Taubes, Gary. "The Ozone Backlash." *Science*, June 11, 1993, pp. 1580-1583. Excellent News & Comment investigation into the vocal criticisms of and debate over the scientific evidence for ozone depletion caused by chlorofluorocarbons. A good critical look at the reliability of both the evidence for man-made ozone depletion and the increasingly vocal criticisms being made against it by some writers and scientists and talk-show host Rush Limbaugh. Portrays the latter group as exploiting and distorting the scientific arguments. In the same issue chemist F. Sherwood Rowland (see listing above) also discusses this issue and presents the scientific evidence relating to it.

Wilson, Philip K. " 'Dear Price . . . Yours Sincerely, A. Conan Doyle': Letters from Conan Doyle in the Harry Price Collection." *ACD—The Journal of the Arthur Conan Doyle Society*, 3:153-195, 1992. Historian of science preparing a work on Doyle's spiritualist crusade came across a series of letters in which Doyle discussed a wide range of his spiritualist beliefs and activities. All are

from the last eight years of his life. They are here printed in full, so future researchers worldwide may benefit.

Wright, Lawrence. "Remembering Satan—Part I" and **"Remembering Satan—Part II."** *New Yorker*, May 17, 1993, pp. 60-81, and May 24, 1993, pp. 54-76. A significant, troubling, well-researched two-article series on the serious problems and abuses of so-called "recovered memories." This is an intimate look at how bizarre allegations of sexual abuse and satanic rites shattered the Ingram family of Olympia, Washington, and escalated into a landmark case in the national obsession with cults and recovered memory. (This case is mentioned in Martin Gardner's "The False Memory Syndrome" in our Summer issue.) An important figure in Wright's articles is social psychologist Richard Ofshe, who helped reveal how serious the problem of "false memories" is. Wright concludes that what took place in Olympia was a "witch-hunt" and that it was only by happenstance that many other lives weren't destroyed. Unfortunately, the same thing is happening elsewhere. Accusations based on recovered memories abound. "Perhaps some of the memories are real; certainly many are false," says Wright. "Whatever the value of repression as a scientific concept or a therapeutic tool, unquestioning belief in it has become as dangerous as the belief in witches. One idea is modern and the other an artifact of what we like to think of as a credulous age, but the consequences, depressingly, are the same."

Wyatt, Petronella. "Signs of the Times." *The Spectator*, 270 (8591): 9-11, March 6, 1993. Astrology has become fashionable among the trend-conscious in England.

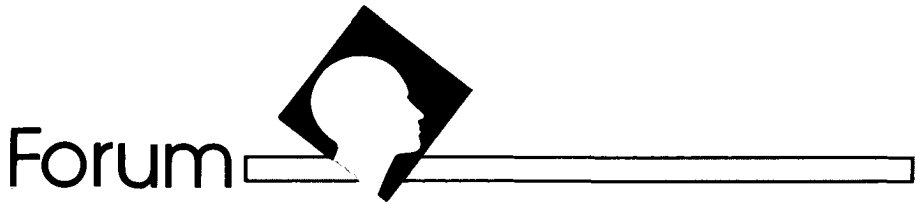
Yam, Philip. " 'Daisy, Daisy.' " *Scientific American* (Science and the Citizen section), May 1993, pp. 32-33. Do computers have near-death experiences? A look at the analogy.

—*Kendrick Frazier and Robert Lopresti*

The "Feeding Frenzy" of Tabloid TV

In the rush to put more and more magazines on the air, . . . taste and integrity and all the intangibles that made CBS News, NBC News, and ABC News respected the world over could get lost. . . . Right now, there is a feeding frenzy, and with it there seems to be an effort, in some quarters, to load up America's television sets with the same garbage that weighs down America's supermarket checkout counters. . . . There's a line that separates the news biz from show biz, and I think the trick is to go up and touch it with your toe, but don't cross it. I think it's being crossed all the time now.

—*60 Minutes* creator Don Hewitt, giving the first William S. Paley annual lecture, Museum of Television and Radio, New York



Science and Truth and Us

RALPH ESTLING

Milton writes somewhere in the *Areopagitica* to the effect that Truth, crushed to earth, will rise again. For, as he goes on to contend, in so many words, whoever heard of a case of Truth, put to a fair test, being bested by Falsehood. Milton neglected to continue this line of argument to its natural conclusion, however, and confess that Truth—which is to say, objective truth and not just Milton's concept of it—is only very rarely, and then generally inadvertently, put to a fair test, with the natural consequence that Falsehood is *continually* besting it. The besting of Truth by Falsehood is what is otherwise known as the history of mankind.

Milton didn't seem to understand history all that well, and the natural consequence of *that* is that he was overly optimistic about the chances of Truth in the ring, continually posting the most absurd odds in its favor, grossly underestimating the pummeling power and quick footwork of Falsehood when Truth has both of its arms and both of its legs tied, as it almost invariably has had them tied throughout the long, sad, bloody, punchdrunk rounds of history.

The thing is, though, Milton's argument applies to science. He wasn't thinking of science when he wrote about the truth, fair tests, and falsehood going down for the count, but science is where his words ring through, with a solidity and resonance they don't have outside of science, out in the general arena where the course of human events wends its way. A scientist can lie and cheat, but only for a while, and he can be honest, and plain wrong, and declare that he's discovered N-rays, polywater, cold fusion, or that molecules in solution can be diluted to nothing and still be effective, but if other scientists are unable to duplicate his experiments and findings, his claims go under. For the proofs of science don't exist in belief, even in belief stained with the blood of martyrs, but only in testability. Nor is scientific truth democratic, a common construct of majority opinion, painstakingly assayed. For thousands, hundreds of thousands of years, everyone believed the sky and all things in it revolved around the earth once a day. But everyone is not enough. Objective reality, external and indifferent to our absolute convictions, determines what is true. How could it be otherwise? So we (some of us) have come at long last to insist on the Autonomy of *things*, quite apart from their being known of by *minds*.

This is a new and radical idea, so new and radical that a number of scientists, including some of the greatest physicists alive, like John Archibald Wheeler, have refused to accept it. It is the minds of conscious,

"That's what I like about science: it tells all of us, including its adepts, its practitioners, its high priests and cockalorums, to go take a flying leap."

intelligent beings that determine what *is*, they say. The Universe exists in a palpable, physical state because it is observed by such illustrious and indispensable entities as ourselves, they say, and perhaps actually believe.

Not all scientists, in other words, have yet grasped what science is and what it demands from us. Many scientists, perhaps a majority, become nervous when the word *truth* is brought to their attention, declaring that the uncovering of truths about the universe is not the job of science; truth, they affirm, is a religious preoccupation, at most a philosophical one, and at any rate it has nothing to do with science. They say, and perhaps believe.

As for the bulk of the human race, it still dwells in a mental Paleolithic, where inscrutable supernatural Forces and Beings—possessing what can only be described as an inordinate fondness for us—design, construct, and maintain Existence for our personal amusement, comfort, and edification. Some scientists think this too. They also think they can think this and still remain scientists in spirit, in heart, and in mind.

The truth, said somebody who clearly hadn't considered the matter, shall make you free. That is the last thing the truth is likely to do. It is far more likely to make you utterly miserable. In any case, truth is not concerned with a person's freedom or sense of the fitness of things or feelings for what is proper, decent, pleasurable, just, and wholesome. Indeed, the truth is not concerned with people at all. After a few million years we should have become at least vaguely conscious of this fact.

Science, often against the will and intent of scientists, makes us very conscious of this fact. That's what I like about science: it tells all of us, including its adepts, its practitioners, its high priests and cockalorums, to go take a flying leap. It can be a cruel master, a harsh, merciless dictator. But it does not lie to us, it does not delude us, it does not deal in deceits. If we wish to lie to ourselves, that is our affair, not science's. If we wish to believe that the universe is an adjunct of our noble minds, we are free to believe it, but we are not free to demand that the universe take us seriously.

A lot of philosophers, and not a few people calling themselves, and actually believing themselves to be, scientists, are unhappy with science, its liking for objective, rather than man-made, truths, its insistence that the experiments work, that the data hold, that the results repeat, and that our likes and dislikes in the case don't matter a hill of neutrinos.

And that is science's glory, its horror, its grandeur, and its despair. It is a big thing. And if we're ever really to come to grips with it, wrestle with it as Jacob wrestled with, and was lamed by, the angel of the Lord, we had better become big too, grow up, come to see things for what they are and not for what we would have them be.

But in the long run, and it will have a nice, long run, truth couldn't care a diddly what we do.

Ralph Estling writes from Ilminster, Somerset, England.

American Indians and the New Age: Subtle Racism at Work

RICK ROMANCITO

The quest for spiritual enlightenment and knowledge is a worthy pursuit and should be encouraged. But something is happening within the New Age movement that has many American Indian people very concerned. It has to do with a misconception that their native religions are openly accessible to non-Indians.

To begin, the beliefs held by the widely varied group of indigenous tribes throughout North America are not part of a single religion. The concept of spiritual entities called *Kachinas* is not part of the same religion as the belief in a spirit road as pursued by followers of the Native American Church, nor is the Plains Indian Sun Dance ritual part of the cycle of ceremonies related to the deer, buffalo, and turtle dances as practiced by the Tiwa Indians of Taos Pueblo.

Each tribe, through centuries of change and often independent of one another, developed different beliefs to try to understand their place in the universe. Some may have grown out of reaction to their environments, or as the result of significant incidents, or as a way to protect their tribes from becoming dissolved into the social and cultural network of surrounding peoples—just like most of the world's religions. But each has always been in a state of active evolution.

The native religion seen in the fifteenth century by Fray Marcos de Niza at Hawikuh, one of the Zuni villages in New Mexico, was likely not the same as he would have seen had he visited some 200 years before. Today the differences are even more significant. Then there is the peyote religion, which spread from Mexico and was adopted among some Plains Indian tribes during the nineteenth century. It, too, has undergone a wide variety of changes and was subject to a number of influences from native and non-Indian sources during its nearly 200 years of existence among the Plains and even older life among the Huichol and others in Mexico.

Yet these differences and their state of evolution never appear to be part of advertisements for "Native American ceremonialism" workshops or seminars. To the uninitiated, it would seem as though the same belief is shared by all Indians, but to Indians, the distinctions are all-important.

When so-called New Age practitioners begin selectively picking and choosing spiritual concepts from several different Indian religions, as if they're products for sale in a cosmic supermarket, the integrity of native beliefs is threatened. On a more subversive level, they exhibit contempt by assigning Indians to a racist stereotype.

The image of Indians as the repositories of "indigenous spiritual knowledge" should share the same garbage heap as that of the drunken Indian and the romantic "end of the trail" warrior. However, it is this image so many New Age non-Indian believers possess about Indians that does more damage to the people they celebrate than they'll ever know.

For example, native religion among Pueblo Indians is closely guarded for a reason. It was practiced for centuries before being forced underground by

Christian missionaries accompanying Spanish colonists who began arriving here [in New Mexico] in the seventeenth century. It exists today as totally nonproselytizing: Pueblo Indian religion seeks no converts. Tribal membership is the only way in and requires a lifelong commitment to the annual performance of rituals that maintain harmony in the spiritual and physical worlds. Each part is important to the whole and cannot be separated without losing its meaning.

This belief system and their native languages are some of the few intangible aspects of native culture that clearly define the identity of tribal members. Despite whatever physical appearance of assimilation, these invisible elements held within their hearts are their pillars of strength.

But, because New Age seekers fail to recognize insurmountable barriers, the unwanted interest in ferreting out "the secrets of Indian religion" continues, and the real concerns of Indian people are overlooked and trivialized as a result.

High unemployment, HIV-AIDS, substandard education, the violation of First Amendment rights to practice native religion, and persistent discrimination and prejudices, all apparently are a little too inconvenient to deal with when a seeker is filled with the fantasy of meeting a "real Native American shaman."

It's time for New Age seekers to get real:

- Those who are genuinely pursuing their native religions don't let non-Indians in on it for pay.
- The authentic practitioners of native religion only deal with Indians.
- You cannot learn anything about Indian religion from a workshop or a seminar.
- The only way to participate in an Indian ceremony is to *be Indian.*

The quest for enlightenment should be encouraged, but not at the expense of robbing a culture because of some fantasy about how Indians worship. Instead, maybe seekers ought to look to their own culture to find those things that are truer to their own natures.

Rick Romancito is a Taos and Zuni Indian. Among his many pursuits is "La Historia," a weekly column he writes for the Taos News, *Taos, New Mexico.*

A Higher Vision

The notion that science and objective thinking are unnatural human activities seems quite radical at first. But when you think about it, monogamy, honesty, and democratic government are unnatural human behaviors as well. We are truly a species that has invented itself out of rather unpromising material. Our only claim to greatness is that we have at times gone against the grain of our own egocentrism to forge a higher vision of the world.

—Alan Cromer, *Uncommon Sense: The Heretical Nature of Science* (Oxford University Press, 1993)

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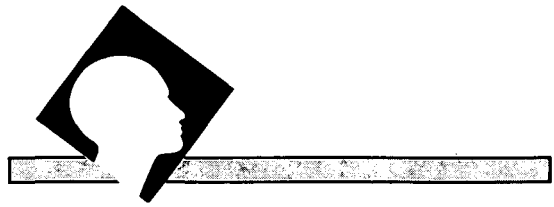

Facilitated Communication

The two articles on Facilitated Communication (Spring 1993) struck home.

As a student intern in the Syracuse public school system during the 1989-90 school year, I was on permanent substitution duty. My major was science education, but I was assigned for 30 days to the autistic unit.

I worked with one of Douglas Biklen's students, an 18-year-old suffering from severe autism, with little communication skill. (In New York State autistic students can remain in the public school system until the age of 21.) While on assignment to "teach" this student, my work included watching him hit a sheet of paper with a crayon continually for hours (this was art class) and keeping him from biting power cords.

When I read in the *Syracuse News* that this same student had been "freed" through the use of Facilitated Communication and read what he had "written," it was obvious that FC was a serious hoax. Ouija boards jumped around in my head.

I was glad to see your article on this subject. Unfortunately, the hoax continues.

Keep up the good work.

E. M. Kinsman
Kinsman Physics Publishing
Rochester, N.Y.

Having been a reader of the SKEPTICAL INQUIRER since the day when it started with a "Z," and having worked with autistic children, I am most ashamed to admit having been taken in by an article in the March 1993 *Reader's Digest* titled "The Secret Life of Arthur Wold." I was so moved by the report that I insisted my wife read it. She has also worked with the autistic.

The article describes Arthur: at age five he was diagnosed as retarded by a psychiatrist, but was found to be quite intelligent at the age of 29 by a woman trained in FC. Of course, such an extraordinary claim should have alerted me to look for extraordinary proof. But it did not. Instead I read on uncritically. The Ouija-ness of the following completely eluded me:

> The young woman [Carol Lewis Crane] grasped Arthur's right arm and, bracing it against hers, held it over the keyboard.
>
> Crane explained: "Facilitated communication generally requires some physical support. . . . You need to support Arthur's arm, providing a constant, backward resistance to give him the control he needs to move toward the letters he wants to type."
>
> Often, Phoebe [Arthur's mother] would forget to provide enough support for a constant resistance for Arthur to work against, and he would mistakenly hit keys that resulted in misspelled words.
>
> She [Phoebe] grasped his hand, and slowly, he spilled out the words onto the screen: . . . [Here follows part of the 23rd Psalm.]

It is sad if not frightening to think of what may happen to the Arthurs of the world if they become nothing more than the planchettes of electronic Ouija boards.

Cliff Sandel
Edmond, Okla.

I hope Kathleen Dillon's article gets to decisionmakers who can mitigate the potential harm done in the name of Facilitated Communication. It's a complex subject, but nonskeptics are cer-

tainly being misled by the standard party line. I think she was very generous in her view of the motivation of all facilitators.

From my experience, many parents are being given false hopes, and it is very hurtful to see them and their children let down.

Frank J. Mandriota, V.P.
Life Science Associates
Bayport, N.Y.

Reading the two articles about autism I was astonished not to see any reference to the publications of Bruno Bettelheim, considered by all workers in the field to be the foremost authority in this regard. He was the first to make a distinction between autism and juvenile schizophrenia and the first to prove that autism is not necessarily definitive and incurable as was written in most handbooks of psychiatrics before his time. Apart from that, congratulations for the excellent standard of the articles about FC.

Frans Kok
Brussels, Belgium

Science, Religion, and 'Awe'

I would like to comment on Richard Dawkins's remarks ("The 'Awe' Factor") published in your Spring 1993 issue (pp. 242-243). It is true that religion and the paranormal have many similarities. Catholic teachings like that of the Virgin Birth are unquestionably paranormal events. But there is one important difference skeptics should remember. Paranormalists insist that many of their most cherished beliefs can be proved in the physical world, whereas religion has never officially made such a claim. Hard proof of God's existence, for example, is simply not available, thus giving rise to the need for faith.

Although I agree that science's "awe" potential could be better exploited, I maintain, with considerable regret, that science still will never lure large numbers away from religion and the paranormal. Why?

1. Because a decent appreciation of science's awe-inspiring properties requires some study, thought, and skepticism. Not so with religion and the paranormal. Their basic precepts can be grasped easily, making the sense of wonder more quickly accessible.

2. In both religion and the paranormal, the "awe" factor is really not the main attraction. Their most seductive offerings are ones that most likely science will never match.

The paranormal's principal appeal is its offer of personal power over phenomena that science says are uncontrollable, such as gravity and time.

Religion's main draw is that it offers answers to life's "big" metaphysical questions, and it provides comfort and reassurance with the promise of justice and eternal life after death. That is why religion has produced very few of what Dawkins calls "results." Religion's results are to be experienced in the afterlife, not in the here and now. Or so they say.

I love your magazine and have been a subscriber for over 10 years. When my 13-year-old nephew comes to visit, he reads it from cover to cover and has commanded me never to let my subscription expire. There's hope yet!

Jean Patacca
Columbus, Ohio

Richard Dawkins's impromptu remarks, although profoundly wise, were also freighted with considerable ambiguity. It is crucial in my view, when discussing the relationship between science and religion, to distinguish between what I should call the natural mystical impulse and its "corruption in committee." In these relatively uncharted waters, it is vitally important that scientists do not find themselves unwittingly trapped in the disinformation nets of the *agents provocateurs* of institutionalized mysticism. Any sane student of comparative religious systems will readily concede the necessity of adopting the method of science when evaluating the theoretical structure, practical aims, and results of religion, *sui generis*. One should exercise

great caution when appraising such symbolic orders of reality. To uncritically swallow the fantastic bait, hook, line and sinker, of populist creeds and cults, however "established" or "historically respectable," only dignifies folly and courts ignorance. . . .

Why should there *have* to be perpetual warfare between Intuition and Reason if our planes of discourse and action remain lucid and clear? The artist lives in a world, or worlds, of feeling and imagination, and the religious temperament is not dissimilar. Indeed, it has been said, with ample justification perhaps, that true poetry is an exalted expression of pure mysticism. Art shares that essential rapport with what we perhaps too loosely call the intuitive or unconscious domain. It would indeed be a sad day for science were ratiocination—which after all is but the purposeful, intellectual manipulation of referential cyphers and symbols—to displace every other mode of creative dialogue with nature.

No doubt Dawkins *is* justified in saying that science, skepticism, and critical thought are under siege—nothing particularly new about that! But it will be, I maintain, a fatal error to adopt a siege mentality or provoke confrontation with such an evasive and insubstantial foe as "faith"; for it may only serve to quicken its devotees' and apologists' lust for power and grandeur—or even worse, elicit some fanatical retaliation in the time-"honored" form of propaganda and intimidation. This is an exceedingly subtle point. I would encourage all true skeptics not to react, but to maintain an invincible posture of ethical inquiry and intellectual precision. Only by adherence to the scientific and scholarly method shall we ever realize, as a species, sufficient wisdom to make the world a healthier star-centered place; a planet whose inhabitants may *freely* choose to live by the light of reason and understanding, not *escamotage* and chicanery. Such a world will indeed be an awesome place.

David Ll. J. Foster
Carsac-Aillac, France

Dawkins's statement was very interesting, on two counts at least.

He urged scientists to match religion in generating "awe" among Americans. That recommendation is more of a loser than a winner. When you get into the awe business, religion will win every time for most people, because it is an emotional response.

Most people don't have, and probably can't appreciate, the awe in sophisticated science. Three salaams to the east, or a chorus of hosannahs for science? Forget it. But that goes over big in religion. They can be given more appreciation of the benefits of pursuing science, and the costs of failure, but "awe" is not a proper term for that.

Bruce Stewart
Department of Biology
Southern Oregon State College
Ashland, Ore.

I was embarrassed to hear that Richard Dawkins had been chided at the Dallas CSICOP Conference for equating religion with less popular pseudosciences. I thought it was obvious; religion is the most pervasive, the most popular, and therefore the most damaging "claim of the paranormal."

I am sick to death of logical and scientific people turning a blind eye to the harmful illogic of religion. The time is long overdue for scientists to speak the facts and stop placating the purveyors of ignorance, no matter how popular, wealthy, and powerful they may be. Richard Dawkins is doing his part.

Randy Yakey
Houston, Tex.

As a longtime reader of *SI* and an even longer-time churchmember, I would like to address a point made by Richard Dawkins in "The 'Awe' Factor." Dawkins is appalled that 54 percent of charitable donations go "to religion" and suggests that scientific charities could

increase their giving level by emphasizing the "romance" of science. I would like to point out that many of us who do most of our charitable giving through churches have reasons that are not just wooly and emotional, but hard-headed and practical. If I drop a $100 check in the offering plate on Sunday morning and write, say, "Somalia famine relief" on the "for" line, how much of that money will get to Somalia? Answer: $100. Not one penny will be syphoned off by any local church or any of its national and international offices. None of it will be spent on overhead, administration, or telemarketers calling at the dinner hour. In fact, the denomination to which I belong (Church of the Nazarene) is so respected for its efficiency and accountability that the governments of several countries have found the best thing to do with their own money earmarked for disaster relief is to give it to the Nazarene Church to administer. Compare this to the record of even very good nonchurch charities and you may find that 54 percent more understandable.

Gloria Wall
Mountain View, Calif.

I've waited 15 years for the SKEPTICAL INQUIRER to even cursorily come to terms with the most damaging hoax in all of human history—those very questionable assumptions of organized religion. Finally, in your Spring 1993 issue, you allow Richard Dawkins to say what I'm sure is on the mind and in the heart of 99 percent of your subscribers—the persistent harm done to rational thinking by the absurd postulates of religion.

I take the same liberty as Dawkins in using the word "religion" to include all the stuff that you tackle—all the UFOs and astrology, spiritualism, levitation—everything. Until formal religion is put on the same level with all other paranormal activity, your organization is only swatting gnats while a hornet is buzzing around.

Fred R. Friplett
Parkersburg, W. Va.

As a confirmed scientific atheist I honestly enjoyed "The 'Awe' Factor." Additionally, there are other, similar thought-provoking questions.

Has science really shown how to best parent children?

How many scientific charities are around for the people's intimate or immediate material needs?

Is there an addict in the gutter who will see the light of science and rationalism to pull himself together?

Somehow, it doesn't happen this way.

Dawkins is correct in stating that science has achieved much in recent times, making our lives easier. Also technology brings a host of problems, too. It's easy to ungratefully take the first for granted and complain a lot about the latter. Perhaps the common man does care more about religion because of the "awe" factor. Till you can compete, it is best not to complain.

Should the majority of people (quasi-religious) be distanced by CSICOP? Many may like our stated goals but be offended by personal viewpoints. Frankly, if Dawkins is going to set up an alternative to what religion provides, I'd much like to hear it. Just not in the SKEPTICAL INQUIRER, please.

Tim Holmes
Fengyan, Taiwan

E-Prime and Isness

When Shirley Temple, after a magnificent career as a child star followed by a graceful adolescence, married and gave birth to a daughter, the *New York Daily News* headline read: "Now Shirley Has a Real Live Dolly All Her Own." From which I concluded that Shirley Temple had grown up, but the headline writer hadn't.

I got somewhat the same feeling when I read Martin Gardner's 1952 animadversions on general-semantics (g-s), which he injected into his piece on E-Prime, English without the verb "to be" (*SI*, Spring 1993). The discipline founded by Alfred Korzybski in 1933 continues to grow and develop, but

Gardner seems stuck in the time-track.

I appreciate that Gardner does recognize clearly that E-Prime is not a necessary practice of general-semanticists, whose reactions may be enthusiasm, indifference, or to use it just as a training device. But those differences are hardly likely to result in the "bloody reprisals" feared by Cullen Murphy; general-semantics finds no virtue in enforcing dogmas. Instead, with its basic notions of consciousness of abstracting, and of the uncertainty and incompleteness of all statements, it encourages good-humored striving for agreement. Small wonder philosophers who want "The Truth" to stand still until they can engrave it in stone find g-s "crankish."

G-s had numerous successful offshoots, like Gerard Nierenberg's Art of Negotiation, or Albert Ellis's Rational-Emotive Therapy (Ellis even translated some of his books into E-Prime), or the many researches listed in Kenneth Johnson's compilation *Graduate Research in General Semantics.*

But what might interest Gardner are our resolutions of semantical paradoxes that have plagued philosopher-mathematicians most of this century. James D. French and I have demolished four famous ones: Frege's "Village Barber"; Berry's Paradox; Russell's "Class of Non-self-including Classes"; and Grelling's "Heterological Terms."

Stuart A. Mayper, Editor
General Semantics Bulletin
Ridgefield, Conn.

As a director of the International Society for General Semantics, I have some comments on Martin Gardner's essay on Alfred Korzybski.

Gardner quotes Bertrand Russell's negative reactions to Korzybski's work; but early in the 1930s, Russell sent the following cable to Korzybski from London: "Your work is impressive and your erudition extraordinary. Have not had time for thorough reading but think well of parts read. Undoubtedly your theories demand serious consideration."

That telegram is cited in *Science and Sanity,* in the back of the book, along with seven pages of strongly favorable quotations from 21 other men of great attainment, representing 15 different fields.

Russell Meyers, chief of neurology and chairman of the Division of Neurosurgery at the University of Iowa, 1946-1963, once described *Science and Sanity* as "the most profound, insightful, and globally significant book I have ever read." I would infer from that statement that Meyers, who also held academic positions in psychology, neuropsychology, and speech pathology, found nothing too terribly amiss with Korzybski's extensive discussions of the nervous system, conditional reactions, and mental illness.

Gardner reports that Korzybski said "1 = 1" is false, on page 194 of his book. Of course, Korzybski said nothing of the sort, on page 194 or anywhere else. We know that he accepted mathematical statements of equality as true, because he described them as being "always correct in mathematics" (p. 195).

With regard to the *symbolic expression* "1 = 1" Korzybski denied *absolute* sameness in <u>all</u> *aspects* (identity). He did not discuss 1 as a *number* (which was W. V. Quine's mistaken interpretation), but as a *symbol.* Every symbol has its physical aspect. Even internal words are the result of electrochemical reactions in the brain. Hence, "not identical in <u>all</u> aspects."

James D. French
Albany, Calif.

The dogmatism, name-calling, inaccurate quotes, repetition of rumors, insulting and misrepresentative cartooning, etc., in Gardner's "E-Prime and Isness" hardly serve the skeptical cause. Gardner's "map" only vaguely resembles the "territory" of general-semantics.

While indicating some of the controversy within the general-semantics community surrounding E-Prime, which eliminates all forms of the verb "to be," Gardner absolutistically rejects any sig-

nificant usefulness for E-Prime, or for general-semantics for that matter.

Neither Korzybski nor all general-semanticists have suggested eliminating all uses of the verb "to be." However, Korzybski's applied neurolinguistic focus and denial of identity (defined as " 'absolute sameness' in 'all' aspects") does lead to, among other things, an emphasis on avoiding the " 'is' of identity," which connects a noun to a noun, and the " 'is' of predication," which connects a noun to an adjective.

Someone may say, "General semantics is a cult" or "General semanticists are eccentric." Such statements may reflect an absolutistic and dogmatic way of evaluating, which, through neurolinguistic mechanisms, may tend to reinforce such dogmatism in oneself and others.

If anything, the development of E-Prime and the debate surrounding it indicate that general-semantics remains a growing and healthily diverse discipline that has much to contribute to the development of a nonabsolutistic, nondogmatic skepticism.

Bruce I. Kodish
Baltimore, Md.

Martin Gardner's 40-year-long antipathy for Alfred Korzybski and general semantics flared up again in his "E-Prime: Getting Rid of Isness." From the title, one might think the article was about E-Prime, the use of English without any form of "to be." But most of it consists of a rehash of tired old stories about Korzybski's eccentricities and egotism, and putdowns of him from various old sources. None of this had much to do with E-Prime, which others developed long after Korzybski's death. The article devoted only a few paragraphs to a rather thin critique of E-Prime.

As near as I can understand it, Gardner's main (if not only) point is that he feels the benefits of E-Prime are not worth the alleged trouble of using that language.

However:

1. Albert Ellis, the founder/guru of Rational Emotive Therapy, has written his books in E-Prime, and considerers E-Prime important in that system of therapy.

2. An increasing number of teachers of English composition are having their students write in E-Prime, to help them develop greater accuracy, clarity, and readability.

The SKEPTICAL INQUIRER does a fine job challenging and exposing the illogical, the irrational, and the unreasonable. But I think you've chosen an inappropriate target here.

Robert Wanderer
San Francisco, Calif.

Thank you for Martin Gardner's article on E-Prime.

I began teaching in 1961, and—together with a colleague, Fred Smith—was told to emphasize critical thinking. How to proceed?

We began by using Chase's *Guides to Straight Thinking* (1954). We were careful about generalizations made. We tried to avoid words like *always* and *never*, which allow for no exceptions. We made efforts to complete comparisons ("Bigger than what?") and discussed impressions given. On writing projects students used words in dictionary ways and tried to avoid "self-evident truths." We developed an awareness of "Black/White Thinking" and singular causations.

The focus continues. We emphasize distinctions between commonly agreed-upon "facts" and the values and interpretations loaded onto these facts. On term projects each student "focuses on a perceived social injustice" and selects an "expert in the area." Then each: (1) summarizes the expert's facts, (2) summarizes his or her prescriptions, and (3) judges reliability by analyzing credentials and logic.

Gardner says that "translating ordinary language into E-Prime may well be good training for someone just learning the kindergarten level of semantics." In high school, we are on the "kindergarten

level of semantics"! I don't tell students to get rid of "isness" or to write in "E-Prime," but apparently I have been influenced by Korzybski's ideas. As used in the ways described, understandings derived from general semantics have been one of the continuing bright spots in my teaching career.

Brant Abrahamson
Riverside-Brookfield H.S.
Riverside, Ill.

Martin Gardner says: "I wouldn't be surprised if someone wrote a novel in E-Prime." And, in fact, someone has, at least in part. Veteran science-fiction readers will be familiar with the name of Alfred Elton van Vogt, author of such novels as *The Weapon Shops of Isher* and *Slan*, and the short story "Black Destroyer," which owed a great debt to John Campbell's "Who Goes There?"

In late December 1971, van Vogt received a phone call from a senior editor of *Saturday Review—The Sciences* asking him for an article on general semantics. Van Vogt wrote the article, titled "The Semantics of Twenty-First Century Science," but policy changes within the *Saturday Review* organization made its publication impossible. It eventually appeared in an anthology called *The Best of A. E. van Vogt*, published in 1976 by Pocket Books. In the introduction to the article, van Vogt wrote: "What does this [general semantics] have to do with reality? General semantics is a systematic approach to reality, that's what."

In the article's afterword, van Vogt concludes: "But we may certainly deduce from the foregoing arguments that reality is not yet available in literature except intuitively, and then only in the works of a few geniuses." Link this statement to the article's third paragraph, where van Vogt writes: "Some years ago I wrote two science-fiction novels, *The World of Null-A* and *The Players of Null-A*, in which, in thousands and thousands of paragraphs, I employed the various GS recommended usages for rectifying *what might be called* the shortcomings of English. . . . For my second semantics-oriented novel, *The Players of Null-A*, I wrote a 22-paragraph explanation of GS, and used one paragraph as the heading of each chapter. The summation took three weeks to do. When it was out of the way, I had *essentially* completed my eight-year study of general semantics."

Andrew Dagilis
Verdun, Quebec
Canada

I'd like to point out that there is an entire language that doesn't use the verb "to be": the Klingon tongue created for the *Star Trek* movies and television series. This feature later caused its inventor headaches when he was asked to translate Hamlet's "To be or not to be" for *Star Trek VI: The Undiscovered Country.*

Klingon may be a fictitious tongue, but it has its own dictionary and I've met people at science-fiction conventions who speak it for fun.

Zen Faulkes
Department of Biology
University of Victoria
Victoria, B.C., Canada

Aha! I thought so! It wasn't I. A. Richards who devised Basic English, but C. K. Ogden.

John Brunner
South Petherton
Somerset, U.K.

Martin Gardner responds:

Bertrand Russell's polite thank-you note was written before he carefully read Science and Sanity. *The statement I quoted was his considered opinion, as well as the opinion of all other leading philosophers of science.*

Readers are urged to check the final chapter of Max Black's Language and Philosophy. *The Count's missunderstanding of Aristotelian logic, Black writes, led him into countless absurdities. "Very little remains of Korzybski's theory of abstractions*

except some hypothetical neurology fortified with dogmatic metaphysics." Ernest Nagel, reviewing Black's book, said: "Black's restrained but nonetheless devastating critique of the basic ideas on which Korzybski rests his pretentious claim is alone worth the price of the book." For Rudolf Carnap's low opinion of the Count, see the index of Dear Carnap, Dear Van *(1990), a collection of letters between Carnap and Quine.*

The eminent semiotician Thomas Sebeok found my column amusing and accurate. Like me, he attended the Count's lectures in Chicago, finding him "arrogant and unpleasant." He recalls the enormous ill feelings that arose between the Count and Hayakawa before the Count's Japanese disciple founded ETC.

I did not say Richards "invented" Basic English. I said he "developed" it, albeit an ambiguous verb easily misinterpreted. Ogden was indeed the inventor, but for 40 years Richards was its chief developer and promoter. Basic's famous list of 850 words was the collaborated effort of the two friends.

Yes, Van Vogt was fascinated by general semantics. He was even more fascinated by Scientology, actually working for years as one of its therapists. I didn't know about the Klingon tongue, which proves I'm not a Trekkie.

Science, technology, and Gore

The juxtaposed articles by Al Gore ("Education for Science") and Evry Schatzman ("A Threat to Science") in the Spring 1993 issue hit me like a ton of bricks.

First, I am very skeptical of Gore's rhetoric. In addition to the aforementioned article, I read his book, *Earth in the Balance*, and got two very different senses of what he is all about. While espousing a very pro-science position (in the article), he seems quite incapable for applying sciencelike discipline (in his book) when evaluating issues that have a scientific nature to them, such as global warming, nuclear power, and pollution.

While Schatzman is right when he suggests that science and technology are different things, the fact is that the general public makes little distinction between the two. From a practical point of view, many politician or advocate types have taken advantage of the confusion and thereby have added to it. Naysayers are adept at melding the scientific unknowns to destroy the technological knowns. Al Gore suggested that if 98 percent of scientists say one thing and 2 percent say the other, then each point of view should get 50 percent of the attention during the "debate." This, I suppose, has an aura of fairness, but is hardly scientific; and it is why minority pseudoscience gets so much undeserved attention. We will lose the benefits of many technologies because of this ascientific approach to public debate on science and technology issues.

Before your readers judge the pro-science nature of Al Gore, I suggest they read his book. (Borrow it; don't buy it.)

Jamie Foster
Pismo Beach, Calif.

The real message of science

I was horrified to see that Paul Friedman apparently suggested that scientific fraud should be dealt with quietly so that the public's faith in science would not be shaken (CSICOP Dallas Conference, *SI*, Spring 1993).

"Faith" is surely the last word that should be mentioned in connection with science. Science should not be seen by the public as something administered by a priesthood in white coats delivering a body of dogma. There is no fixed scientific truth in which to have faith, but an approach and attitude of mind that demand scrupulousness and honesty. One of the real strengths of science is that results from the most eminent scientists are in principle open to question. Publicizing the occasional case of fraud serves to illustrate the openness of scientific thinking.

Science is under constant attack from antirationalists who think that science can be invalidated by the defeat of a particular theory or set of results.

Unfortunately some scientists, too, seem to believe that science is simply the sum of its results and that these results should be protected at all costs. Scientists should be doing everything possible to get across the real message of science: that it is about skepticism and openness of mind. Building up "faith" in science only serves in the long run to undermine science.

Diana Brown
Epalinges, Switzerland

A new myth?

Is a new myth starting to make the rounds?

On a recent trip to London, I visited Speakers' Corner at Hyde Park: home of free speech on a soapbox. According to a speaker of fundamentalist leanings, the late Isaac Asimov had been reluctant to admit his disbelief in religion.

In the best tradition of Hyde Park hecklers, I challenged the speaker. He had no source for his claim (of course), but offered to mail it to me. I suggested that he instead visit a library and read what he had probably never seen before: a selection of Asimov's writings.

Another well-known myth has a dying Charles Darwin repudiating his life's work. At least Asimov is in good company in fundamentalist tall tales.

Joseph Aspler
Kirkland, Quebec
Canada

Licensing of science

I applaud the efforts of CSICOP to defend freedom of speech against those who would inhibit it with harassing lawsuits or other means.

At the same time, those who defend their own right to free speech are most effective when they grant the same right to others. Bearing this in mind, Elver Barker's suggestion that graphologists should not have "the legal right to practice their claimed 'science,' for payment or not" (Book Reviews, Spring 1993) is simply shocking.

What Barker is proposing amounts to governmental licensing of science, with no methods of scientific (or pseudoscientific) study permitted except for those authorized by the government. Such licensing would amount to blanket intellectual censorship. Aside from any other considerations, how would graphologists provide the studies that Barker finds so lacking if performing the necessary experiments was illegal?

Barker does set specific limits on the ban that he proposes, on the basis of how the interpretations are used. But this amounts to holding the analyst responsible for the actions that others take based upon his interpretation. Moreover, the inclusion of "personal relations" and "other areas where honesty, justice, and scientifically determined facts should be the rules" covers virtually everything—most notably including scientific research.

In a free society, rational ideas can win out over irrational ones. But the attempts to ban pseudoscience only makes political authority the criterion of truth and is deadly to the advancement of knowledge.

Gary D. McGath
Penacook, N.H.

UFOs, NDEs, and fantasy

Gordon Stein, in his review of the book *Omega Project* by Kenneth Ring (*SI*, Spring 1993), rejects the implications of Ring's research, which suggests that people who report "UFO-abductions" and those who report "near-death experiences" (NDE) share a common personality characteristic: "Fantasy Proneness."

Stein fails to offer any alternative hypothesis, prompting me to suspect that he prefers that such reports remain "mysteriously inexplicable."

Philip J. Klass
Washington, D.C.

Why not a dream?

I would like to question the nature of an experience mentioned three times in your last two issues. Robert Baker, reviewing Ronald Siegel's *Fire in the Brain* (Winter 1993), writes: "Many people wake from a deep sleep to find an incubus . . . or some other night terror sitting on their bed." His point is that such "hallucinations" are common. Similarly, a book on supposed UFO kidnappings, reviewed in the Fall 1992 issue, found that 18 percent of interviewees had experienced "waking paralyzed with a sense of a strange person or presence or something else in the room." Finally, Peter Huston describes such an experience in detail, in the same issue.

I have experienced the following: *dreaming* that I have awakened to find strange people present and/or a choking, paralyzed sensation. I can often make an effort to wake up. When I do, I'm pleased to note that all the unpleasantness has faded, though the room is sometimes rather warm.

Nowhere in Huston's article is proof given that he was awake. He says he "awoke unable to move and finding that the telephone cord somehow became draped over my body and was . . . electrocuting me. In time it was over. I was able to move again. . . . I was . . . confused to discover that the telephone cord was far on the other side of the room." His point is that such experiences are normal. But how did he know that "it was over" doesn't just describe the process of waking up? Sometimes his wife was present. Did she see his eyes opening or what? If you are alone, how could you judge that you had been awake, hallucinating, not asleep, dreaming, unless you wrote on a pad: "I am awake, seeing aliens!" But if you felt paralyzed, you probably didn't do that. Again, Huston cites "hypnopompic hallucinations . . . when one awakes but sees imagery." Where's the proof it was no dream?

Barbara Friedberg
New York, N.Y.

Earth and life

A small correction, if you please, to the discussion of the Gaia hypothesis between Robert Clear and Phil Shannon (Letters, *SI*, Spring 1993). They are quite right that solar irradiation alone cannot account for the mean temperature of Earth, nor for its relative stability for billions of years, during which the sun's output has increased. However, a "baseline" temperature cannot be obtained by simple interpolation between the present values for Venus and Mars. As both gentlemen observe, matters are much more complicated than that. I don't know what they mean by a "gray body." In physics, a "black body" is a perfect absorber and radiator. If Earth were one, its temperature today would be 255 K, or −18°C, whereas the actual value is +15°C. Obviously factors like the greenhouse effect are at work, but not this one exclusively.

As for temperature stability, geologist friends tell me that nonbiological processes—subduction, orogeny, chemical weathering, etc.—account for at least a great deal of it. This requires the presence of liquid water, which Earth was apparently just enough cooler than Venus to retain. It is not yet sure how large a role life plays. That remains for science to establish. Nobody disputes that life is a tremendous geological force. Whatever the details turn out to be, surely the work of Lovelock and Margulis will be a great help in understanding them.

Poul Anderson
Orinda, Calif.

Women and skepticism

In your report on the CSICOP Conference session, "Gender Issues in Science and Pseudoscience" (*SI*, Spring 1993, p. 231), psychologist Susan Blackmore is quoted as opening her talk with the question, "Why are so few members of CSICOP women?" and as adding that, while women in science are rare, "even fewer women are skeptics."

These generalizations are stated as fact, but without any supporting data.

As a woman, a skeptic, and an *SI* reader, I object. I expect to find unsupported conclusions in the journals you criticize, not in the SKEPTICAL INQUIRER itself.

I realize that your report is just a brief summary of her talk. Maybe she gave data on skepticism among women that the reporter left out in the interest of brevity. I for one would like to see the missing figures.

What, please, is the actual breakdown of CSICOP members by gender?

And on what does she base her conclusion that skepticism is rare among women? The surveys she cites do not seem to support that view.

And on what basis does she compare the (unquantified) number of women who are skeptics to the (not cited) number of women who are scientists, leading her to conclude that skeptics are "even fewer" than scientists among our gender?

Melanie Nickel
San Diego, Calif.

In answer to one of Melanie Nickel's questions: CSICOP doesn't have "members" as such, but 4 of CSICOP's approximately 60 Fellows (elected for distinguished contributions to science and skepticism) and 5 out of its approximately 58 Scientific Consultants are women. Susan Blackmore is, by the way, a member of CSICOP's Executive Council. Our last random-sample survey of SKEPTICAL INQUIRER subscribers (April 1986) found that 9 percent were female. We would very much like to increase participation by women in all of these categories and welcome suggestions.—The Editor

Why didn't psychics predict these?

I like to check the accuracy of psychics' predictions.

In the past month, four extraordinary things have occurred. A large bomb was detonated in the World Trade Center in New York, causing extensive damage. An abortionist was murdered in cold blood in broad daylight by an anti-abortionist in Pensacola, Florida. An attempted raid on a bizarre cult in Waco, Texas, was a standoff and resulted in a mass-death tragedy. And a large snowstorm set records in the Eastern United States.

Three of these involved religious groups. (I have not heard that any radical group has called the National Weather Service to claim responsibility for the snowstorm.) All of them have enough effect on the people involved that they should have very strong auras extending backwards in time, or whatever causes predictions.

Did any psychic, anywhere, predict any of these events and publish the prediction beforehand? (The old "I tried to warn everyone but nobody answered the White House phone" trick doesn't count.)

Mark Lutton
Malden, Mass.

Correction on Jaegers

We made an editing mistake in Michael R. Dennett's letter, "Beverly Jaegers," in our Summer 1993 issue (p. 447). In the fourth paragraph, line 5, Dennett had written, "Her actual involvement in police cases. . . ." The "her" referred to Karen C. Uchima, not to Beverly Jaegers, as we improperly assumed in changing the pronoun to "Jaegers" in attempting to clarify the antecedent.—*Eds.*

The letters column is a forum for views on matters raised in previous issues. Brief letters (less than 250 words) are welcome. They should be typed double-spaced. Due to the volume of letters, not all can be published. Address them to Letters to the Editor, SKEPTICAL INQUIRER, 3025 Palo Alto Dr. NE, Albuquerque, NM 87111.

Local, Regional, and National Skeptics Organizations

The organizations listed below have aims similar to those of CSICOP but are independent and autonomous. They are not affiliated with CSICOP, and representatives of these organizations cannot speak on behalf of CSICOP.

UNITED STATES

ALABAMA. **Alabama Skeptics,** Emory Kimbrough, 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 (205-759-2624).

ARIZONA. **Tucson Skeptical Society** (TUSKS), James McGaha, Chairman, 5655 E. River Rd., Suite #101-127, Tucson, AZ 85715. **Phoenix Skeptics,** Michael Stackpole, Chairman, P.O. Box 60333, Phoenix, AZ 85082.

CALIFORNIA. **Bay Area Skeptics,** Wilma Russell, Secretary, 17723 Buti Park Court, Castro Valley, CA 94546. **East Bay Skeptics Society,** Daniel Sabsay, President, P.O. Box 20989, Oakland, CA 94620 (510-420-0702). **Sacramento Skeptics Society,** Terry Sandbek, 3838 Watt Ave., Suite C303, Sacramento, CA 95821-2664 (916-488-3772).

COLORADO and WYOMING. **Rocky Mountain Skeptics,** Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306.

DISTRICT OF COLUMBIA, DELAWARE, MARYLAND, and VIRGINIA. **National Capital Area Skeptics,** c/o D. W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

FLORIDA. **Tampa Bay Skeptics,** Gary Posner, 1113 Normandy Trace Rd., Tampa, FL 33602 (813-221-3533).

GEORGIA. **Georgia Skeptics,** Becky Long, President, 2277 Winding Woods Dr., Tucker, GA 30084.

ILLINOIS. **Midwest Committee for Rational Inquiry,** Danielle Kafka, President, P.O. Box 2792, Des Plaines, IL 60017-2792. **Rational Examination Assoc. of Lincoln Land** (REALL), David Bloomberg, Chairman, P.O. Box 20302, Springfield IL 62708 (217-787-9098).

INDIANA. **Indiana Skeptics,** Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

KENTUCKY. **Kentucky Assn. of Science Educators and Skeptics** (KASES), Chairman, Prof. Robert A. Baker, 3495 Castleton Way North, Lexington, KY 40502.

LOUISIANA. **Baton Rouge Proponents of Rational Inquiry and Scientific Methods** (BR-PRISM), c/o Wayne R. Coskrey, P.O. Box 82060, Baton Rouge, LA 70884-2060.

MASSACHUSETTS. **Skeptical Inquirers of New England.** Contact Laurence Moss, Ho & Moss, 72 Kneeland St., Boston 02111.

MICHIGAN. **Great Lakes Skeptics,** Carol Lynn, contact, 1264 Bedford Rd., Grosse Pointe Park, MI 84230-1116.

MINNESOTA. **Minnesota Skeptics,** Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416. **St. Kloud ESP Teaching Investigation Committee** (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

MISSOURI. **Kansas City Committee for Skeptical Inquiry,** Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124. **Gateway Skeptics,** Chairperson, Steve Best, 6943 Amherst Ave., University City, MO 63130.

NEW MEXICO. **New Mexicans for Science & Reason,** John Geohegan, Chairman, 450 Montclaire SE, Albuquerque, NM 87108; John Smallwood, 320 Artist Road, Santa Fe, NM 87501 (505-988-2800).

NEW YORK. **New York Area Skeptics** (NYASk), Wayne Tytell, contact person, 159 Melrose Ave., E. Massapequa, NY 11758, (516) 798-6902. **Western New York Skeptics,** Tim Madigan, Chairman, 3965 Rensch Rd., Buffalo, NY 14228.

OHIO. **South Shore Skeptics,** Page Stephens, 6006 Fir Avenue, Cleveland, OH 44102 (216-631-5987). **Association for Rational Thinking** (Cincinnati area), Joseph F. Gastright, Contact, 111 Wallace Ave., Covington, KY 41014, (513) 369-4872 or (606) 581-7315.

PENNSYLVANIA. **Paranormal Investigating Committee of Pittsburgh** (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217 (412-521-2334).

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The Committee for the Scientific Investigation of Claims of the Paranormal

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- Prepares bibliographies of published materials that carefully examine such claims
- Encourages research by objective and impartial inquiry in areas where it is needed
- Convenes conferences and meetings
- Publishes articles that examine claims of the paranormal
- Does not reject claims on a priori grounds, antecedent to inquiry, but examines them objectively and carefully

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